The Family Eatoniellidae in New Zealand

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Abstract

A new family, the *Eatoniellidae* is proposed and 23 new species, 5 new subgenera and 3 new genera are described. Classification of the 43 New Zealand species has been based, where possible, on a combination of the morphology of the shell, the operculum, the radula and the exposed animal.

Introduction

Hutton (1882) described the external features of the animal, radula and operculum of a small black mollusc he called *Dardania olivacea*. Suter (1913) included this species in *Eatoniella* Dall, 1876, a genus erected for *Eatonia kerguelenensis* Smith, 1875, which has a similar operculum and radula. Iredale (1915) erected *Dardanula* for *Dardania olivacea* Hutton, as Hutton's genus was preoccupied, with the explanation, "The operculum differs at sight from that of *Eatoniella*, so that a generic distinction must be allowed." The operculum of the type of *Eatoniella*, in fact, differs from that of *Dardanula olivacea* only in a few minor details. The shells and radulae of several species of *Dardanula* do show small, but constant, differences from *Eatoniella* s.s. so that the name *Dardanula* is retained as a subgenus of *Eatoniella*. *Pellax huttoni* (Pilsbry), a species previously classified in the Phasianellidae because of its colour pattern, is also included in *Eatoniella*, with *Pellax* Finlay (1927), reduced to subgeneric level. The anatomy of *E.* (*D.*) *olivacea* and *E.* (*P.*) *huttoni* will be described elsewhere (Ponder, —a.). They differ from any other known prosobranch in the combination of characters they possess, as shown below, and a new family, the Eatoniellidae, is erected for them.

The eatoniellids are the dominant, small, algal dwelling molluscs on New Zealand shores. They are micrograzers and microdetritus feeders, scraping the diatomaceous film from the subtratum over which they crawl. A few species are restricted to fairly deep water, but the majority are found in the lower littoral zone. Many of the species discussed below are new, as their similar appearance has made separation on shell characters alone, difficult.

The New Zealand species have previously been classified in *Dardanula, Notosetia, Estea, Zeradina, Pellax, Epigrus* and *Skenella*.

Various genera have been classified near *Eatoniella* by Coan (1964), because they were believed to possess an opercular peg, but most are in no way related (see Ponder 1965, b and d). These include

Barleeia Clark, *Boogina* Thiele, *Diala* A. Adams (*"Diala" marmorea* Carpenter has an opercular peg, but this species together with other North American *"Diala"* species, belong to a new genus related to *Barleeia,* true *Diala* having a simple operculum), *Eatonina* Thiele, *Eatoniopsis* Thiele, *Hemistomia* Crosse, *Tatea* Tenison-Woods and *Rissoina* d'Orbigny.

The evolution of the opercular peg has obviously occurred several times in very different lines of evolution, involving at least three superfamilies—the Neritacea, Littorinacea, and Rissoacea. The advantage of such a structure must be considerable and, in most cases, is concerned with the attachment of a branch of the columella muscle, to allow rapid withdrawal of the animal into the shell. In most instances the pegged operculae are much more solid than are simple operculae in related genera. For example *Rissoina* has a solid pegged operculum, while that of *Zebina* is thin and simple. *Tatea* and *Hemistomia* have produced a different type of peg, a calcareous deposit on the thin horny operculum, which only doubtfully functions in the same way as that of *Eatoniella.* With the development of a peg, the corresponding thickening of the operculum is correlated with the necessity for a strong surface of attachment for the peg and its muscles so that force on the peg will move the whole operculum.

Other groups that have evolved opercular processes are the *Scrobs-Anabathron* group (Rissoidae), which has a small raised ridge on the middle of the columella edge, and a new family (Ponder,—c.) which has an operculum very like that of *Eatoniella.* The opercular peg is clearly a structural modification evolved in several prosobranch groups, and should be used with caution as an indicator of phylogenetic relationship.

THE TERMINOLOGY OF THE ANIMAL, OPERCULUM AND RADULA

As the descriptive terminology of the animal, operculum and radula is rather unsettled, brief definitions of the terminology used are given. The definitions are restricted to the littorinacean—rissoacean type of animal, an oligogyrous operculum and a taenioglossan radula. Some of the terms are illustrated in text figure 1.

Animal

Head

Cephalic tentacles—paired tentacles arising from the head.

Snout—an anterior protuberance of the head, which bears the mouth terminally.

Foot

Propodium—a dorsal flap situated on the anterior end of the foot.

Mesopodium—the anterior half of the foot.

Metapodium—the posterior half of the foot.

Opercular lobes—the fleshy, lateral lobes bearing the operculum.

Accessory Tentacles

Opercular tentacle—tentacle arising from the opercular lobes.

Caudal tentacle or metapodial tentacle—tentacle arising in the mid-dorsal line, posterior to the opercular lobe.

Pallial tentacle—tentacle arising on the edge of the mantle cavity.

Pedal Mucous Glands

Anterior mucous gland—situated and opening between the pro- and mesopodium.

Sole gland—a collection of subepithelial gland cells opening between sole epithelial cells.

Posterior mucous gland—a gland in the central part of the foot that opens into the metapodium.

Mucous slit or mucous pore—the opening of the posterior mucous gland.

Operculum

Orientation

Right and left ends—are those edges on the extended animal's right and left side respectively.

Columella edge—the edge against the inner side of the aperture when retracted, or the anterior edge when extended.

Outer edge—the edge against the outer side of the aperture when retracted of the posterior edge when extended.

Morphology

Nucleus—the coiled portion, involving all but the last, or major, coil.

Last whorl—the last, or major, coil of the operculum.

Columella marginal area—a distinct area, not always present, along columella edge.

Outer marginal area—as last, on outer edge.

Muscle insertion area—the area of muscle attachment on the inner side of the operculum is often a distinguishable surface which is roughened and/or opaque.

Internal ridge—a strong ridge running parallel, but somewhat internal to, the columella edge.

Peg—an outgrowth, or apophysis, from the inner surface of the operculum.

Sculpture

Growth Lines—the natural growth curves.

Spiral lines—run in the same direction as the coiling of the operculum.

Description

Thickened—(when term applied to whole operculum) not readily pliable, (when applied to a certain area) thicker than the majority of the operculum.

Curved—bent when viewed from the side.

Concave and Convex—the direction of curve taken from the outside surface.

Radula

Teeth

Central—(rachidian or median), the middle or first tooth of the radula row.

Lateral—the second tooth of the radula row (paired).

Inner marginal—the third tooth of the radula row (paired).

Outer marginal—the fourth tooth of the radula row (paired).

Orientation

Outer—towards the outside of the ribbon.

Basal or Ventral and—

Upper or Dorsal—taken as if the tooth were upright with the cutting edge uppermost.

Lateral—both sides of a tooth.

Minor Terminology

Cutting edge—edge with cutting processes.

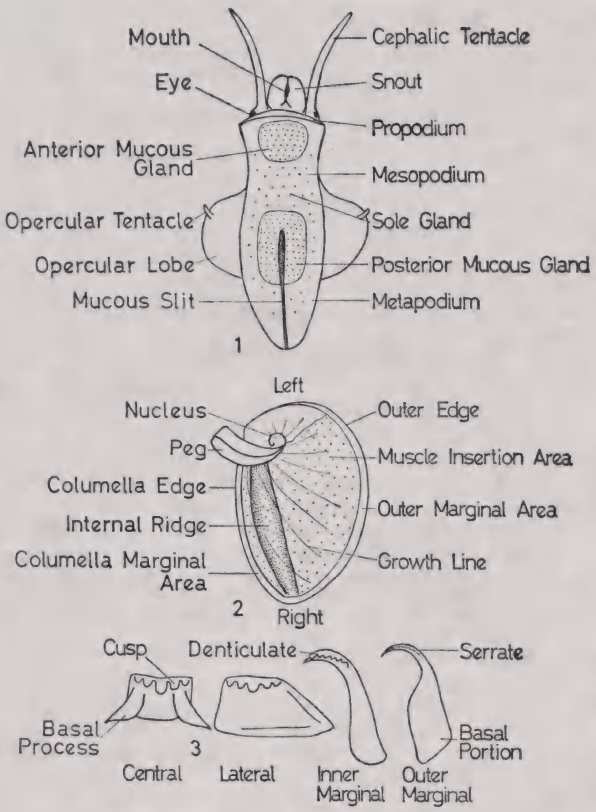
Cusp—a large, distinct cutting process.

Denticle—a small, indistinct cutting process.

Serrations—fine, numerous cutting processes.

Process—a thickened portion, at least partly separate from the tooth, and not involved in the cutting edge.

Cusp Formula—is written in the order:—small lateral cusps—large main cusp—small lateral cusps.



TERMINOLOGY

Fig. 1. Animal (ventral view).
2. Operculum (inner side).
3. Radula.

The shell, animal, operculum and radula are described for each species as far as they are known. In most cases the specimens of which the animal was observed and the operculum and radula obtained, were collected in the same locality, which is given in brackets after the heading 'animal'. If, however, the radula and/or operculum examined was from an animal from a different locality, this locality is added in brackets after the headings 'operculum' or 'radula', as the case may be. All of the figures of shells in the plates are to scales.

Abbreviations

A.M.—Auckland Museum; Cant. Mus.—Canterbury Museum; Coll.—Collection; D.M.—Dominion Museum; G.S.—Geological Survey; O.I.—Oceanographic Institute.

Eatoniellidae n. fam.

Shell: Simple, conical, usually smooth, rarely spirally sculptured. Protoconch usually smooth, not distinctly marked off from adult shell. Aperture simple, ovate, not distinctly angled. Outer lip often strongly excavated.

Operculum: Oval to ear shaped; nucleus small, marginal indistinct; convexly curved; a thickened curved peg emerging from the nucleus and extends past columella edge.

Radula: Central large, approximately square, with two strong basal processes, cusps few. Lateral tooth short, approximately rectangular, with few cusps. Inner marginal narrow, curved, with larger and fewer cusps than outer marginal. Outer marginal finely serrate, terminal half strongly curved, basal half abruptly expanded. Jaw strong, a series of chitinous rods.

Animal: Cephalic tentacles long, mobile; eyes on swellings at outer bases of tentacles. Snout bilobed, mobile. Sole with a prominent mucous slit in posterior half into which a posterior mucous gland opens. Anterior and sole mucous glands also present. Opercular lobe sometimes with short tentacles developed on right and left or left sides. No caudal or pallial tentacles.

Mantle cavity with osphradium, monopectinate gill, and hypobranchial gland all well developed. Prostate and pallial oviduct open. No penis in male. Large glandular structures, possibly homologous with oesophageal pouches open into posterior end of buccal cavity of *Littorina*. Oesophageal glands present, stomach with style sac but no crystalline style.

The *Eatoniellidae* differs from any other described family in the combination of the following major characters:—the simple conical shell, the pegged operculum, the 'littorinid' type of radula, the presence of opercular tentacles in some species, the aphallate males, and the open prostate and pallial oviduct. The *Littorinidae* has an open prostate but the pallial oviduct is closed while the males of this family and the *Lacunidae* are phallate. The *Rissoidae* has both the prostate and pallial genital duct closed and a phallate male, while the *Cingulopsidae* is characterised by the aphallate male, but the female has a closed pallial oviduct.

Skenella Martens and Pfeffer, 1886, and *Cerostraca* Oliver, 1915, and possibly *Lucidesta* Laseron, 1956, and *Mesodesta* Laseron, 1956, belong in the *Eatoniellidae*.

A KEY TO THE GENERA OF THE EATONIELLIDAE

Genus	Shell	Operculum
Eatoniella	Ovate-conical, smooth, moderately thick to thin.	Muscle insertion area opaque and distinct.
Crassitoniella (nov.)	Ovate-conical, smooth or with a weak peripheral spiral cord, thick and solid.	Muscle insertion area indistinct and transparent.
Liratoniella (nov.)	Elongate ovate-conical, rather solid, with a few strong spiral cords.	Muscle insertion area, opaque and distinct.
Skenella	Small, depressed, spire almost flat, thin.	Muscle insertion area indistinct, transparent.
Pupatonia (nov.)	Minute, white, pupoid, with fine, dense, spiral sculpture.	Unkown.

A Summary of the Key Characters of the Subgenera of Eatoniella

By using the characteristics of *Dardanula* as a basis, only the points distinguishing each *subgenus* from *Dardanula* are given. A dash shows that the details are largely unknown.

Subgenus	Shell	Animal	Operculum	Radula
Dardanula	Solid, ovate-conical, variously coloured, imperforate or very narrowly umbilicate. Peristome thickened, outer lip straight or retracted. Protoconch opaque.	0-1 opercular tentacles on left lobe, no definite group of mucous cells on right lobe.	Muscle insertion area extensive, only a narrow outer marginal area. Spiral sculpture weak or absent. Black, brown or yellowish. Internal ridge present or absent.	Central and lateral with few large cusps. Inner marginal with few cusps (1-6 usually 3), S-shaped; outer marginal with a broad basal area.
Abscindostoma (nov.)	Large, rather thin, outer lip strongly retracted.	1 opercular tentacle on left lobe, a definite group of mucous cells on right lobe.	Yellowish-white. No spiral sculpture. No internal ridge.	
Albitoniella (nov.)	Pale coloured.	———	Yellowish-white. No internal ridge.	Marginal with many small cusps (3 + 1 + 5), inner marginal simple, a simple curve (not S-shaped). Outer marginal with basal portion only weakly expanded, not serrate.
Albosabula (nov.)	Small, solid, white.	———	Yellowish-white. No internal ridge.	Inner marginal nearly straight, finely denticulate (6-9 denticles).
Cerostraca	Small, thin, posterior corner of aperture bent downwards rather strongly; usually a varix-like thickening just behind aperture	0-1 opercular tentacles on left lobe, a definite group of mucous cells on right lobe.	Yellowish-white. No internal ridge.	5 denticles on inner marginal.
Caveatoniella (nov.)	Small, thin, aperture separate from body whorl, distinctly umbilicate.		White. No internal ridge	
Dardaniopsis (nov.)	Small, thin, globose, outer lip bisinuate.	1 opercular tentacle on each lobe.	Muscle insertion area broken some distance from outer margin. Yellowish-white. No internal ridge.	Inner marginal with 4-7 denticles.
Eatoniella	Large; protoconch semi-transparent, colourless. Adult whorls dark coloured.		Spiral striae rather distinct. Yellowish-white Weak internal ridge.	Inner marginal with 5-7 denticles.
Pellax	Very large, red with white markings.	Red, 1 opercular tentacle on each lobe, a group of mucous cells on right.	Reddish-brown. No internal ridge.	Inner marginal with a broad base.

Genus **Eatoniella** Dall, 1876 (nom. nov. pro Eatonia Smith, 1875, non Hall, 1857).

Type (s.d. Suter, 1913): *Rissoa kerguelenensis* Smith, 1875.

Shell: Small to minute, usually rather solid, smooth, whorls weakly to moderately convex. Protoconch smooth, dome-shaped, not distinctly marked off from adult whorls. Aperture ovate, D-shaped, or pyriform, peristome moderately thickened, usually not reflected, outer lip usually suddenly bent downwards posteriorly, straight or excavated below. Perforate or imperforate. No sculpture apart from growth lines, and, sometimes, faint spiral scratches.

Animal: As described for family. Opercular lobe with or without a single opercular tentacle on each side.

Operculum: Oval to pyriform; muscle insertion area distinct, opaque; peg strong, usually grooved, extending beyond columella margin, at a moderate angle to horizontal plain of rest of operculum. Nucleus small. Columella margin flat to convex, never strongly convex.

Radula: As described for family.

Subgenus **EATONIELLA** (s.s.)

The following account applies only to the New Zealand species, as I have only examined the shell of the type, which is from Kerguelen Island, and the available descriptions of the radula and operculum, especially the latter, are not very comprehensive. However, these structures appear to be very similar to the New Zealand species of the subgenus.

Shell: Large, imperforate, whorls weakly convex, dark grey or purplish-black. Protoconch semi-transparent, colourless. Peristome moderately thickened, outer lip a little retracted.

Animal: Details unknown, though generally similar to other members of the family.

Operculum: Spiral sculpture rather prominent, internal ridge weak or absent, a distinct longitudinal line breaks muscle insertion area at its outer edge near right end. Colour yellowish.

Radula: Central 3 + 1 + 3; lateral 2 + 1 + 3; inner marginal 5-7 denticles, outer marginal with a thick portion at ventral end, finely serrate, basal half expanded.

Eatoniella kerguelenensis chiltoni (Suter). Pl. 4, figs. 2-8.

1909 *Rissoa chiltoni* Suter, Subantarctic Is. N.Z. 1, p. 18, pl. 1, fig. 2.
1913 *Rissoa* (*Eatoniella*) *chiltoni* Suter; Suter, Man. N.Z. Moll. p. 223, pl. 13, fig. 15.
1915 *Dardanula chiltoni* (Suter); Iredale, Trans. N.Z. Inst., 47, p. 454.
1955 *Dardanula chiltoni* (Suter); Powell, Cape Exped. Series, D.S.I.R., Bull. 15, p. 87.

This species has a much wider distribution than was previously realised. Specimens from the Chatham Islands, though very variable (figs. 2, 3), are very similar to typical shells. The species also occurs

in Dunedin Harbour (fig. 6) where it is probably relict from a colder period.

E. kerguelenensis (Smith) from Kerguelen Island (pl. 4 fig. 1) has also been recorded from Macquarie Island (Tomlin, 1948, B.A.N.Z.A.R.E. Ser. B., 5(5), p. 226) but I have not seen the specimens. *Chiltoni* is very similar to the Kerguelen shell and, in my opinion, should be regarded as a subspecies of it. There is nothing in the available description of the radula and operculum that disagrees with this conclusion.

The holotype of *chiltoni* is a rather large shell with weakly convex whorls, a transparent white protoconch and dark grey coloration. It has a small umbilicus and the outer lip is slightly retracted. The columella and the last part of the body whorl are light grey and the inside of the aperture is blue-grey. The colour is fairly constant, though often there is a faint yellow line below the suture and the intensity of the grey is rather variable and sometimes has a reddish tinge. The shell size, shape, and the convexity of the whorls and the presence of an umbilicus are all variable features. However, the subspecies is easily distinguished by the large, thin, light shell, greyish colour and large transparent-white protoconch. The latter feature is especially useful in the identification of juveniles.

Animal: (Campbell Island). Cephalic tentacles long, tapering, yellowish; eyes moderately large at their outer bases, with a patch of black pigment behind. Snout bilobed, black except for terminal lobes which are yellowish (probably white in life). Opercular lobe dense black. Mantle not pigmented. There do not appear to be any opercular tentacles. (Preserved material).

Operculum: (Fig. 8): Oval, yellow, muscle insertion area large. A very weak, rather irregular, internal ridge which makes a small break in muscle insertion area at outer marginal area near right end. Growth line weak and fine spiral sculpture present. Peg of moderate size. A distinct spiral line emerges from nucleus and continues for a short distance. Marginal area rather narrow.

Radula: (Fig. 7). Typical of the genus and very similar to that of *E. kerguelenensis kerguelenensis* (see Thiele, 1912). Central 3 + 1 + 3, oval with two basal processes. Lateral 2 + 1 + 3, wide, with a solid basal projection and a strong ridge on the upper margin. Inner marginal with 5 denticles, outer with about 8 fine serrations and a wide basal half.

Holotype: (Fig. 5). Campbell Island, Coll. C. Chilton (Cant. Mus.). Height 2.53 mm. Width 1.5 mm.

Material Examined:

Holotype; Ships' Channel side of Quarantine Island, Dunedin Harbour, Corallina, brown algae, fine red algae, 4/5/63 (W.F.P.); Portobello, Dunedin Harbour, 2-3 fathoms, Finlay Coll. (A.M.); Dunedin Harbour, Finlay Coll. (A.M.); Portobello, brown algae, Corallina, under stones, 3/9/63 (W.F.P.); Snares Islands, under stone, G. A. Knox, 29/1/61 (D.M.); Faith Harbour, Auckland Islands, beach drift (A.M.); Campbell Island, Cape Expedition, J. Sorensen (A.M.); N.Z.O.I. Stat. D.2, Garden Cove, Campbell Island, shore algae (O.I.); Waitangi, Chatham Islands in pools and on algae, W. R. B. Oliver, 8/12/09 (D.M.); Waitangi, A. W. B. Powell, —/2/33 (A.M.); Chatham

Island Exped. Stat. 16, Kaingaroa, 27/1/54 (D.M.); Chatham Island Exped., Port Hutt, Chatham Islands, shell sand, 8/2/54 (D.M.); Chatham Islands Exped. Stat. 13, Owenga, 4-6 fathoms, 27/1/54 M.V. "Alert" (D.M.); Tioriori, Chatham Islands, Dell Coll. (D.M.).

Distribution: Dunedin Harbour and the Snares. Auckland, Campbell and Chatham Islands.

Eatoniella (Eatoniella) stewartiana n.sp. Pl. 4, figs. 9, 10.

Though closely related to *E. kerguelenensis chiltoni* (Suter), the new species differs in its smaller size, relatively larger aperture, thinner, semi-transparent shell, rounded body whorl more convex whorls, and false margined sutures. The outer lip is evenly and fairly strongly retracted. The protoconch is transparent pale grey, and the rest of the shell purplish black. There is a pale band below the suture.

Animal: (Paratype). Exposed parts unpigmented, apparently very pale pinkish. The mantle cavity roof is black. Buccal mass pale yellowish. (Dried material).

Operculum: (Fig. 10). Rather thin for genus, curved, with no thickened ridge internally, yellow, with faint spiral sculpture. A longitudinal distinct line breaks the muscle insertion area, near the right end of the outer side. A spiral line emerges from the nucleus at the left end. Peg a little longer than that of *E. chiltoni*. A marginal area distinct on all edges.

Radula: Similar to that of *E.* (*E.*) *kerguelenensis chiltoni*. Central 3 + 1 + 3, lateral 2 + 1 + 3, inner marginal with 7 denticles.

Holotype: (Fig. 9). Ocean Beach, Stewart Island, in *Brostrycia* near high tide, -/7/62 (ex Smith Coll.) (A.M.). Height 2.0 mm. Width 1.15 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, and Smith Collection.

Material Examined:

Holotype and paratype; 1½ fathoms off Portobello, Dunedin Harbour, 3/9/63 (dead shells) (W.F.P.); Ship's Channel side of Quarantine Island, Dunedin Harbour, *Corallina*, 4/9/63 (W.F.P.); Taieri Beach, algae, Finally Coll. (A.M.); Riverton, Finlay Coll. (A.M.); Bluff Harbour, *Corallina*, M. Spong, 27/5/63 (W.F.P.); Leask's Bay, Stewart Island, algae (Powell Coll.); Mason Bay, Stewart Island, algae, -/4/58 (Smith Coll.); Lee Bay, Stewart Island, *Corallina*, -/1/55 (Smith Coll.); Halfmoon Bay, Stewart Island, algae, E. Smith, 12/6/52 (W.F.P.); Aker's Point, Halfmoon Bay, M. Spong, 22/2/63 (W.F.P.).

Distribution: The South East of the South Island and Stewart Island living in algae in most of the intertidal zone.

E. (*E*) *stewartiana* is closely allied to *E.* (*E.*) *kerguelenensis chiltoni*, and seems to replace it at Stewart Island and Southland. Both species are found in Dunedin Harbour, though *E.* (*E.*) *stewartiana* is much less common.

Subgenus **Abscindostoma** n. subgen.

Type: *Rissoina olivacea* var. *lutea* Suter, 1908.

Shell: Large, rather thin, imperforate. Whorls weakly convex. Peri-

stome rather thin, outer lip strongly and evenly retracted. Colour variable.

Animal: Left opercular lobe with 1 tentacle, right with a definite group of mucous cells. Often secondarily green from an unknown cause.

Operculum: Muscle insertion area extensive, spiral sculpture absent. No internal ridge. Colour yellowish.

Radula: Central 3 + 1 + 3; lateral 1-2 + 1 + 2-3. Inner marginal with 4 denticles. Outer marginal typical, base very broad.

This subgenus has some features in common with *Dardanula* and *Cerostraca*. The size of the shell agrees with *Dardanula*, but the retracted aperture, some features of the animal, the operculum and the radula are all rather similar to *Cerostraca*. *Abscindostoma* differs from *Cerostraca* in the large shell, with no sign of a varix-like thickening behind the aperture, and the green colour of the animal. However, despite its apparent close similarity to *Cerostraca*, *Abscindostoma* appears to be a natural group, worthy of subgeneric distinction.

Eatoniella (Abscindostoma) lutea (Suter). Pl. 9, figs. 11-14.

1908 *Rissoina olivacea* var *lutea* Suter, Proc. Mal. Soc. 8, p. 33.
1913 *Rissoina* (*Eatoniella*) *olivacea* var *lutea* Suter; Suter, Man. N.Z. Moll. p. 226.
1915 *Dardanula olivacea* var *lutea* Suter; Iredale, Trans. N.Z. Inst. 47, p. 454.
1937 *Dardanula olivacea lutea* Suter; Powell, Shellfish of N.Z. p. 70.

This species has previously been classified as a variety of *E. olivacea* (Hutton) and, later, as a subspecies. The two species are, in fact, very distinct.

The shell of *E. lutea* is rather large for the genus, of light build and generally of pale colour. Yellowish-white, pinkish, orange-pink, grey green and dark grey specimens are encountered but usually in a given locality only one or two intergrading colour forms are found. In some areas shells showing a sutural and peripheral series of small pale blotches are encountered. The whorls are faintly convex and the periphery rounded. The outer lip is characteristic in being strongly and evenly retracted basally and the peristome is only slightly thickened.

The large size, light build, pale coloration, and strongly retracted outer lip, make this species distinctive. The darker colour forms approach *E. albocolumella* n. sp., but the two species are distinguishable on the basal coloration, as the presence of a sharply defined white zone in the region of the umbilicus and columella in *E. albocolumella*, is in sharp contrast to the uniform coloration of this region in *E. lutea*.

Animal: (Takapuna, Auckland). (Fig. 12). Cephalic tentacles long, active, with faint, very minute pustules on their surface. Eyes large, in swellings on outer bases of tentacles. Foot long, rounded anteriorly, slightly constricted behind anterior edge, posterior end rounded. Posterior pedal mucous gland large, white, opening into an open slit which extends from centre of foot to posterior end. Sole ciliated, cilia long on anterior edge, beat in posterior direction. Snout short, bilobed. Colour greenish-grey, sole yellowish-white, opercular lobe dark green-grey; buccal mass normally red but often invaded by green pigment, wholly or partially, giving it a bright green colour. One opercular tentacle on left opercular lobe, a patch of large mucous cells on right opercular lobe.

The green coloration of the animal is possibly due to ingested chlorophyll pigment that has been stored in the integument or, perhaps, to an algal symbiont.

Operculum: (Fig. 13). Oval, curved, thickened, yellow, with no obvious spiral sculpture or internal ridge. Peg short, stout and grooved. Marginal area well defined. Muscle insertion area extensive, occupying most of operculum, bordered on columella side by a weak, raised, ridge. Weak growth lines visible.

Radula: (Fig. 14). Typical of genus. Central 3 + 1 + 3, lateral 2 + 1 + 2, inner marginal 2 + 1 + 1, the third a rather large cusp; outer marginal with about six fine serrations.

Lectotype: Maloney's Reef, Auckland (G.S.).

Type Specimens: Height 2.5-2.7 mm. Width 1.4-1.5 mm. (from Suter).

Paralectotype: (Fig. 11). Height 2.53 mm. Width 1.36 mm.

Material Examined:

Paralectotypes; Cape Maria van Dieman, shell sand (W.F.P.); Takapau Kura, Spirits Bay, algae (Powell Coll.); Spirits Bay, shell sand (Hipkins Coll.); Doubtless Bay, Finlay Coll. (A.M.); Whangaroa Harbour, algae (Hipkins Coll.); Cavalli Islands, off Whangaroa, algae, -/6/52 (D.M.); Taupo Bay, Whangaroa, shell sand, E. R. Richardson, 11/4/51 (D.M.) and 2/1/54 (Hipkins Coll.); Tapeka Point, Russell, Dell Coll. (D.M.) and -/1/52 (Hipkins Coll.); Whangaruru, shell sand, 16/2/56 (W.F.P.); Smuggler's Bay, Whangarei Heads, algae, 16/5/62 (W.F.P.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.) and algae, 22/5/63 (W.F.P.); Tryphena, Great Barrier Island, -/1/51 (Hipkins Coll.); Goat Island Bay, Leigh, brown algae, 1963-64 (W.F.P.); Tawharanui Point, *Cystophora,* 31/12/63 (W.F.P.); Waiwera, *Carpophyllum* spp., 16/2/64 (W.F.P.); Motutapu Island (Powell Coll.); Takapuna, Auckland, Finlay Coll. (A.M.); Takapuna reef, *Carpophyllum* spp., 1962-64 (W.F.P.); Brown's Bay, Auckland, brown algae, 19/1/64 (W.F.P.); Narrow Neck Reef, Auckland, brown algae on exposed side, 1962-64 (W.F.P.); Jackson's Bay, Coromandel, *Carpophyllum plumosum,* 19/3/64 (W.F.P.); Stony Bay, Coromandel, large brown algae, 28/3/64 (W.F.P.); Sandy Bay, Coromandel, large brown algae, 30/3/64 (W.F.P.); Cape Runaway, algae, A. W. B. Powell, -/8/33 (Powell Coll.); Tolaga Bay, R. K. Dell, 28/11/50 (D.M.); Gisborne, shell sand, 1906 (D.M.); Lyall Bay, Finlay Coll. (A.M.); Breaker Bay, Wellington, Finlay Coll. (A.M.); Island Bay, Wellington, brown algae, *Caulerpa, Corallina,* 28/2/59 and 3/6/62 (W.F.P.); Island Bay, Finlay Coll. (A.M.); Titahi Bay, 1905 (D.M.); Karehana Bay, Plimmerton, *Carpophyllum Xiphophora,* 7/12/61 (W.F.P.); between Pukerua and Paekakariki, brown algae, 24/12/61 (W.F.P.); Sharks Tooth Reef, Kaikoura, fine brown algae, P. Luckens, 12/8/64 (W.F.P.); Taylor's Mistake, Bank's Peninsula, *Cystophora* in pools, W. R. B. Oliver, 10/4/10 (D.M.); East of Diamond Harbour, Lyttelton Harbour, brown algae, *Corallina,* -/9/63 (W.F.P.); Lyttelton, H. Suter (D.M.); East of Purau, Lyttelton Harbour, fine brown weed, coralline algae, W. R. B. Oliver, 4/9/10 (D.M.); Chatham Island Exped., Port Hutt, Chatham Island, 8/2/54 (D.M.).

Distribution: The East Coast of the North Island, the Wellington West Coast, and the North East of the South Island, on large clean algae on exposed coasts. The single record from the Chatham Islands needs confirmation.

Ecology: *E. (A.) lutea* is abundant only on large brown algae such as species of *Carpophyllum,* though it also occurs on short algae such as *Corallina,* possibly by accidental colonisation by wave dislodged individuals. At Takapuna and Narrow Neck, Auckland, where conditions

ranging from a fairly exposed rock face to a silted, sheltered pool or channel, occur within a few yards, an interesting gradation of frequency of occurrence can be seen in *E. lutea*. In the most exposed situations it is common and dominant, occurring with a large form of *E.* (*D.*) *olivacea* (Hutton), but it is usually replaced by *E.* (*D.*) *varicolor* n. sp., which it superficially resembles, in the low tidal pools and fairly sheltered channels. In very sheltered situations it is altogether absent, while *E.* (*D.*) *olivacea* and *E.* (*D.*) *limbata* (Hutton) are common, the latter being dominant in the most sheltered and silted places.

Eatoniella (Abscindostoma) albocolumella n. sp. Pl. 9, figs. 15-18.

Shell small, thin, semi-transparent, smooth, shining, imperforate variably coloured. Spire tall, conical, with straight outlines; whorls 5, lightly convex, false margined; protoconch moderately large, smooth, of similar colour to spire whorls, not distinctly marked off; body whorl with a rounded periphery and base. Aperture moderately large, oval; peristome continuous, weakly thickened; outer lip sharp, thickened a little posteriorly and internally, strongly and broadly excavated. Inner lip evenly concave and produced a little below. A narrow groove in umbilical region, but no umbilicus. Colour variable, usually dark purplish grey, sometimes uniform as in the holotype, except for the lower part of the base and columella which are always white. Usually with a series of irregular white blotches below sutures and/or on periphery, these frequently becoming broadly developed as irregular white zigzag markings. There is great variation within populations, all intergradations between nearly pure white shells and uniform dark shells occur.

The species superficially resembles *E.* (*D.*) *limbata* (Hutton), but is easily separated from it by the thin shell, strongly reflected outer lip, more irregular markings and white umbilical region.

Animal: (Piha, Leigh). (Fig. 16). Cephalic tentacles long, very mobile, tapering, colourless, transparent, eyes on swellings on outer bases of tentacles and situated beneath transparent edge of shell. Snout short, bilobed, dorsally and terminally yellowish, sides black. Buccal mass orange. Posterior dorsal and lateral parts of head, sides of foot and opercular lobe black, amount of pigmentation varying. Foot moderately long, with a slit extending from middle region of sole to posterior end, and surrounding this is the dense-white posterior mucous gland. Parts of dorsal side of foot and snout are sometimes green. A short opercular tentacle, smudged with black, on left opercular lobe, a group of white gland cells on right lobe.

Operculum: (Fig. 17). Oval, yellow, curved. Marginal areas rather narrow, columella side broader. Peg stout, grooved. No internal ridge or thickening. Muscle insertion area dense yellow-white, extensive.

Radula: (Fig. 18). Central large 3 + 1 + 3, lateral, 1 + 1 + 3, with a dorsal thickening, elongate. Inner marginal with 3 main denticles and a very small cusp-like process on outer side. Outer marginal with a broad base and finely serrate.

Holotype: (Fig. 15). Cape Campbell, coralline algae, 16/2/64, Coll. W. Ballantine (A.M.). Height 2.37 mm. Width 1.35 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; 4 fathoms between Cape Maria van Diemen and mainland, -/2/61 (Hipkins Coll.); Spirits Bay, shell sand (Hipkins Coll.); Takapau Kura, Spirits Bay, algae, A. W. B. Powell, -/2/32 (Powell Coll.); Tom Bowling Bay, -/1/54 (Gardner Coll.); 12 fathoms, Doubtless Bay, Finlay Coll. (A.M.); Doubtless Bay, E. A. Brookes, Oliver Coll. (D.M.); Waiau Beach, Mangonui, E. R. Richardson, 11/4/51 (D.M.); MacGregor's Bay, Whangarei Heads, algae, 22/5/63 (W.F.P.); Ocean Beach, Whangarei Heads, algae, 7/5/62 (W.F.P.); Smugglers' Bay, Whangarei Heads, *Carpophyllum plumosum*, 6/5/62 (W.F.P.); Bream Tail, 12/8/63, under stones, small algae, *Carpophyllum* spp., 12/8/63 (W.F.P.); Laings Beach, Mangawai, shell sand (Hipkins Coll.); Goat Island Bay, Leigh, under stones, brown algae, *Corallina* (W.F.P.); Tawharanui Point, North side, under stones on papa platform, 31/12/63 (W.F.P.); Okupu, Great Barrier Island, *Carpophyllum*, under stones, -/11/63 (W.F.P.); Kaitoke, Great Barrier, *Corallina*, short soft algae, 16/11/63 (W.F.P.); Motutapu Island, Auckland, Dell Coll. (D.M.); Narrow Neck Reef, Auckland, *Carpophyllum plumosum*, 26/3/63 (W.F.P.); southern end of Muriwai, *Corallina* in pool, under stones, 19/8/63 (W.F.P.); Piha, various algae, 1963-64 (W.F.P.); Jackson's Bay, Coromandel, *Carpophyllum plumosum*, 29/3/64 (W.F.P.); Stony Bay, Coromandel, brown algae, 28/3/64 (W.F.P.); Sandy Bay, Coromandel, brown algae, 30/3/64 (W.F.P.); Waihi, *Corallina* (W.F.P.); off Mayor Island, in fish stomach contents, G. Williams (Powell Coll.); Cape Runaway, algae, A. W. B. Powell, -/8/33 (Powell Coll.); Gisborne, shell sand, 1906 (D.M.); Castle Point, algae, J. E. Morton, -/3/63 (W.F.P.); Day's Bay, Wellington Harbour, brown algae, 11/12/61 (W.F.P.); Lyall Bay (A.M., D.M.); Owhiro Bay, Wellington, *Corallina*, 20/2/63 (W.F.P.); Oaro, South of Kaikoura, coralline algae, W. Ballantine, 19/2/64 (W.F.P.); Taylor's Mistake, Bank's Peninsula, coralline algae, -/8/63 (W.F.P.).

Distribution: North Island, North East of South Island and Chatham Islands, typically on exposed coasts.

Ecology: This species is often abundant in coralline algae and short turf algae on exposed coasts, but it is also found, to a lesser extent, under stones and on coralline and brown algae on coasts of moderate exposure.

Subgenus **Albitoniella** n. subgen.

Type: *Dardanula pallida* Powell, 1937.

Shell: Similar to *Dardanula*, but of rather lighter build. Colour pale yellowish.

Animal: Details unknown.

Operculum: Muscle insertion area extensive. Colour yellowish. No internal ridge.

Radula: As described for *E.* (*A.*) *pallida*. The features of the radula sharply separate *Albitoniella* from the other subgenera of *Eatoniella*.

Eatoniella (Albitoniella) pallida (Powell). Pl. 6., figs. 16-18.

1936 *Dardanula pallida* Powell, Discov. Rep. 15, p. 203, pl. 53, fig. 16.

Shell small, thin, smooth, shining, elongate-conical. Whorls 4½, faintly convex, false margined, with fine growth lines and subobsolete spiral scratches; protoconch smooth, dome-shaped, not clearly marked off; periphery subangled, base convex. Aperture oval, peristome thin, continuous; inner lip slightly thickened; outer lip thin, sharp, retracted, bent downwards and produced forward posteriorly. A tiny chink in position of umbilicus sometimes continued as a shallow, narrow, groove separating body whorl and inner lip. No true umbilicus. Colour yellow-

ish-brown, colourless and transparent just behind aperture, and bordering this behind, is a narrow pure white strip. Variation in size, relative width, and density of colour.

Animal: (Off Three Kings Islands). Appears to be typical of family. Unpigmented except for proximal half of snout and edges of opercular lobes, which are dark grey. Eyes large, at bases of long, colourless tentacles. (Preserved material).

Operculum: (Fig. 17). Ear shaped, pale yellowish, slightly curved, muscle insertion area extensive, opaque; marginal areas narrow and transparent. Peg long, curved, grooved. Very faint spirals and growth lines visible.

Radula: (Fig. 18). Central large, typical of the genus, 3 + 1 + 3. Lateral large, rather short, with very small cusps, 3 + 1 + 5, with dorsal and ventral thickenings. Inner marginal atypical of genus, a simple curve, distally pointed, basally thickened; outer marginal long, distally pointed and curved, basal portion relatively narrower than in other eatoniellids.

Holotype: Discovery II Stat. 933, off Three King Islands, in 260 metres (British Museum).

Height 1.65 mm. Width 1.05 mm. (from Powell).

Material Examined:

Paratypes (Powell Coll.); N.Z.O.I. Stat. C.760, 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, bryozoan substrate, 18/2/62 (O.I.); off Mayor Island, in fish stomach contents, G. Williams (Powell Coll.)).

Distribution: Off the North and North East of the North Island, in moderately deep water, probably restricted to bryozoan substrates.

Eatoniella (Albitoniella) thola n. sp. Plate 6, fig. 19.

Shell small, smooth, shining, with a blunt protoconch. Whorls 3½, lightly convex, false margined, thin, transparent, protoconch large, bluntly dome-shaped, smooth, not distinctly marked off; body whorl large, periphery and base rounded. Aperture large, round, peristome continuous, weakly thickened; inner lip spread over body whorl as a thin layer; columella weakly thickened, vertical; a narrow chink behind columella but no umbilicus; outer lip excavated below, dilated, bent downwards slightly posteriorly, a transparent narrow zone behind. Colour pale yellowish, a narrow white band below periphery and umbilical region.

There is some variation in the height of the spire and the bluntness of the protoconch.

Animal, radula and operculum unknown.

Holotype: (Fig. 19). N.Z.O.I. Stat. C.760, 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, 18/2/62 (O.I.).

Height 0.95 mm. Width 1.25 mm.

Paratypes: Auckland and Dominion Museums, N.Z. Geological Survey, Lower Hutt, N.Z. Oceanographic Institute.

Material Examined: Holotype and paratypes.

Distribution: In moderately deep water off the Three Kings Islands.

This species is only tentatively placed in *Albitoniella* with which it agrees, fairly closely, on shell characters.

Subgenus **Albosabula** n. subgen.

Type: *Rissoa lampra* Suter, 1908.

Shell: Small, white, outer lip a little retracted.

Animal: Details unknown.

Operculum: Muscle insertion area extensive. Yellowish-white.

Radula: As described for *E. (A.) lampra*. The most characteristic feature is the inner marginal which has 6-9 small denticles and is nearly straight, not curved or S-shaped as in other subgenera.

Eatoniella (Albosabula) lampra (Suter). Plate 10, figs. 6-9.

1908 *Rissoa lampra* Suter, Proc. Mal. Soc. Lond., 8, p. 29, pl. 2, fig. 25.
1913 *Rissoa (Cingula) lampra,* Suter; Suter, Man. N.Z. Moll. p. 208, pl. 12, fig. 15.
1915 *Estea lampra* (Suter); Iredale, Trans. N.Z. Inst., 47, p. 454.
1933 *Notosetia lampra* (Suter); Powell, Rec. Auck. Inst. Mus., 1 (4), p. 198, pl. 34, fig. 7.
1962 *Notosetia lampra* (Suter); Smith, (in part), Rec. Dom. Mus., 4 (5), p. 54.

Smith (1962) has described and figured a shell from Stewart Island which she thought was the local form of *E. (A.) lampra,* but here it is considered to be a separate species. *E. (A.) lampra* is also found at Stewart Island and the two species are distinguishable on minor characters. A description of a typical shell from Stewart Island is given below.

Shell small, solid, opaque. Spire tall, whorls 4½ to 5, flat, with a faint depression below a weak subsutural swelling on body whorl; body whorl not swollen. Aperture oval, with a distinct posterior angle; peristome thickened; inner lip thickened, oblique, straight above, curved anteriorly, distinct, but not separated from body whorl by a groove. Outer lip nearly straight, suddenly bent downwards posteriorly, thickened in this portion and below, while a very shallow, small, false sinus, formed by partial retraction of outer lip which straightens below. No varix-like thickening behind outer lip. Colour yellowish-white, often coated with brown.

Animal: (Kaikoura). Tentacles long, eyes at their outer bases. Snout bilobed, rather long. Colour yellowish white. (Preserved specimen).

Operculum: (Fig. 8). Oval, slightly curved, muscle insertion area semi-opaque, extensive, marginal areas rather narrow, transparent. Colour yellowish, muscle insertion area yellowish-white. Peg strong, short, rather broad, grooved. Growth lines very weak.

Radula: (Fig. 9). Typical of genus, ribbon long, narrow, teeth small. Central relatively large, 2 + 1 + 2, lateral 3 + 1 + 3, elongate. Inner marginal nearly straight, with about 6 small denticles, outer-most largest. Outer marginal finely serrate, base wide.

Lectotype: Titahi Bay, Cook Strait (G.S.).

Height 1.5 mm. Width 0.8 mm. (from Suter).

Paralectotype: (Fig. 6). Height 1.1 mm. Width 0.625 mm.

Material Examined:

Paralectotypes; Makara, Wellington, M. Mestayer, 26/8/36 (D.M.); Karaka Bay, Wellington, under stones on gravel bank, R. K. Dell, 6/2/48 (D.M.); Island Bay, Wellington, 3/6/62 (W.F.P.); Shark's Tooth Reef, Kaikoura, under stones, embedded in shell sand, P. Luckens, 12/8/64 (W.F.P.); East of Diamond Harbour, Lyttelton Harbour, under stones, -/8/63 (W.F.P.); Groper Island, near Bravo Island, Paterson Inlet, Stewart Island, algae, 1/7/53 (Smith Coll.); Ruggedy, Stewart Island, 25 fathoms, on bryozoans, 4/11/56 (Smith Coll.); Butterfield's Beach, Stewart Island, O. Allan, -/10/47 (D.M.); Aker's Point, Halfmoon Bay, Stewart Island, under stones, M. Spong, 22/2/63 (W.F.P.); 10 fathoms, off Owenga, Chatham Islands, A. W. Powell, -/2/33 (A.M.).

Distribution: The southern portion of the North Island, the East Coast of the South Island, Stewart Island and the Chatham Islands. In the lower littoral zone, this species lives underneath stones.

Eatoniella (Albosabula) poutama (Smith). Plate 10, fig. 11.

1962 *Zeradina poutama* Smith, Rec. Dom. Mus., 4 (5), p. 62, fig. 4.

E. (A.) poutama is closely allied to *E. (A.) rakiura* n. sp., but also superficially resembles *E. (D.) dilatata* (Powell). The shell is a little larger than *rakiura* and *E. (A.) lampra* (Suter), and is redescribed below for comparison.

Shell semi-transparent, smooth, white, thin but not fragile, periphery and base rounded, body whorl swollen. Whorls 4-4½, convex, false margined; body whorl large. Aperture thickened, oval, slightly angled above; inner lip thickened, concave, separated from body whorl by a narrow but distinct, groove. Outer lip a little bent downwards posteriorly, with a weak false sinus similar to that of *E. (A.) lampra*. Animal, operculum and radula unknown.*

Smith describes the exterior of the operculum as having "numerous radiating wrinkles spreading from a point below the middle of the inner margin."

Holotype: Off Poutama Island, South Cape, Stewart Island, 30 fathoms, in bryozoan shell sand, W. Hopkins (D.M.).

Height 1.44 mm. Width 0.88 mm.

Material Examined:

Paratypes (A.M.); Doubtful Sound, 50 fathoms (W.F.P.); Snares Islands, 50 fathoms, Finlay Coll. (A.M. and D.M.); 85 fathoms, Auckland Islands, Finlay Coll. (A.M.).

Distribution: Fiordland, Stewart Island, and the Snares and Auckland Islands. Smith (1962) records this species living under stones embedded in muddy sand at Stewart Island (Horseshoe Bay and Halfmoon Bay).

Smith has included this species in *Zeradina,* but the shell, in most features, is unlike the fossarids, while it is clearly related to the *E. lampra* group.

Note—Since the above was written, the author has examined specimens of *E. (A.) poutama,* which have typical eatoniellid operculae.

Eatoniella (Albosabula) rakiura n.sp. Plate 10, fig. 10.

1962 *Notosetia lampra* (Suter), Smith (in part) Rec. Dom. Mus. 4 (5), p. 54, fig. 10.

The shell is similar to E. (*A.*) *lampra* (Suter), but differs from that species in its more swollen, weakly convex, false margined whorls which number 4. Shell semi-transparent, fragile; aperture oval, the posterior angulation less marked than in *lampra;* peristome a little thickened; inner lip angled in central part, outer lip straighter and the posterior bent portion not as marked as in *lampra,* the false sinus just discernible.

The main distinguishing points are the thin shell and the evenly convex, swollen whorls.

Animal: Unpigmented, (preserved material).

Operculum: Very similar to that of *E.* (*A.*) *lampra.* Oval, but a little flattened on left end, insertion area similar in extent to *E.* (*A.*) *lampra,* but marginal areas a little wider. Peg short, stout, grooved. Colour yellowish, muscle insertion area yellowish-white, opaque, rest of operculum transparent. A few faint spiral striae visible.

Radula: Similar to that of *E.* (*A.*) *lampra* but the inner marginal has more denticulations, there being about 9, all of similar size.

Holotype: (Fig. 10). Ruggedy, Stewart Island, 25 fathoms on bryozoan, 4/11/56 (ex Smith Coll.) (A.M.).

Height 1.1 mm. Width 0.65 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt, E. Smith Coll.

Material Examined:

Holotype and paratypes; Butterfield's Beach, Stewart Island, O. Allan, -/10/47 (D.M.); Groper Island, near Bravo Island, Patterson Inlet, Stewart Island, algae, 1/7/53 (Smith Coll.).

Distribution: Stewart Island.

Subgenus **Caveatoniella** n. subgen.

Type: *E.* (*C.*) *puniceomacer* n. sp.

Shell: Small, ovate, thin, widely umbilicate. Whorls strongly convex. Peristome thin, inner lip separated from body whorl.

Animal: No opercular tentacles.

Operculum: Muscle insertion area extensive. Colour white.

Radula: As described for *E.* (*C.*) *puniceomacer* n. sp.

Eatoniella (Caveatoniella) puniceomacer n. sp. Pl. 10, figs. 16-18

Shell minute, thin, semi-transparent, pink, rather loosely coiled, with a wide umbilicus. Whorls $3\frac{1}{2}$, strongly convex, a little flattened on shoulder, protoconch rather flattened. Spire variable in height, the shoulder not present in tall shells, but flattened and cut in at sutures in squat shells (holotype intermediate). Sutures false margined. Sculpture of growth lines only, becoming prominent around the large, deep,

circular umbilicus. Aperture oval, peristome continuous, nearly completely separated from body whorl, only slightly thickened. The outer lip is not retracted. Colour uniform pale pink, protoconch white. Fresh shells are purplish-black owing to the colour of the visceral mass.

Animal: (Taurikura Bay). Cephalic tentacles long, not tapering, bluntly pointed, colourless, eyes at outer bases of tentacles. Snout short, bilobed. Foot with a mucous slit in posterior half. No opercular tentacles. Eyes and snout remain beneath transparent edge of shell.

Operculum: (Off Mayor Island) (Fig. 17). Thickened, slightly curved, muscle insertion area opaque, extensive, marginal area rather narrow and clear. Peg rather long and narrow, solid, white. Sculptured with faint spirals and weak growth lines.

Radula: (Fig. 18). Central rather small for genus, with two very strong basal processes, cusps 1 + 1 + 1, central cusp strong. Lateral 1 + 1 + 2, the cusp small. Inner marginal with 5 moderately strong denticles; outer marginal finely serrate, with broad basal portion.

Holotype: (Fig. 16). Tryphena Bay, Great Barrier Island, in shell sand (ex Hipkins Coll.) (A.M.).

Height 0.95 mm. Width 0.73 mm.

Paratypes: Auckland Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt, N.Z. Oceanographic Institute, and K. Hipkins Collection.

Material Examined:

Holotype and paratypes; Spirits Bay, shell sand, (Hipkins Coll.); Taupo Bay, Bay, 12 fathoms, W. LaRoche (Powell Coll.) and Oliver Coll. (D.M.); 10 fathoms, Awanui Bay, Finlay Coll. (D.M.); Taupo Bay, Whangaroa, 2/1/54 (Hipkins Coll.); Tapeka Point, Russell, -/1/52 (Hipkins Coll.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.); Taurikura Bay, Whangarei Heads, shallow channel in coarse sand, 18/5/61 (W.F.P.); Great Barrier Island, 8-10 fathoms, Dell Coll. (D.M.); off Otata Islands, Noises Group, Hauraki Gulf, 4 fathoms, coarse sand, 15/5/63 (W.F.P.); off Mayor Island in fish stomach contents, G. Williams (Powell Coll.).

Distribution: The North East of the North Island in shallow water.

Eatoniella (Caveatoniella) perforata n. sp. Plate 10, fig. 19.

Shell small, white, ovate conic, umbilicate. Whorls 4½, moderately convex, false margined, smooth and polished, except for growth lines and faint spiral scratches; protoconch dome-shaped, smooth, depressed, not marked off. Body whorl swollen, periphery and base convex. Aperture ovate, distinctly angled above. Peristome thin except where inner lip attached to body whorl, where it is somewhat thickened, the thickened edge sharply separate from body whorl. Columella portion of inner lip thin, separated from base by umbilicus. Outer lip straight, thin. Umbilicus rather wide, deep, strong growth lines in groove below.

Animal, operculum and radula unknown.

Holotype: Doubtless Bay, 12 fathoms, Coll. W. LaRoche, ex Finlay Coll. (A.M.).

Height 1.25 mm. Width 0.83 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt, N.Z. Oceanographic Institute.

Material Examined:

Holotype and paratypes; off Hen and Chickens Islands, Finlay Coll. (A.M.).

Distribution: The North East of the North Island in moderately deep water.

Subgenus **Cerostraca** Oliver, 1915.

Type (o.d.): *C. iredalei* Oliver, 1915.

The most distinctive features of the Kermadec Island *E.* (*C.*) *iredalei* (Oliver) (Pl. 9, figs. 1, 1a) are the detached aperture and the varix-like callosity behind the outer lip. These features are also seen, but to a lesser degree, in a new species from New Zealand, *E.* (*C.*) *delli*, described below. This species closely resembles another new species, *E.* (*C.*) *maculosa*, which has only a suggestion of the apertural features seen in *E.* (*C.*) *iredalei*, yet it is clearly closely allied. *Dardanula tenella* Powell, from off the Three Kings resembles the last mentioned new species, but has little in common with *E.* (*C.*) *iredalei*. A third new species from the South Island and Stewart Island, *E.* (*C.*) *bathami*, closely resembles *E.* (*C.*) *delli* n. sp. and *E.* (*C.*) *maculosa* n. sp. in radula and opercular characters and the shell is not discordant with a new conception of *Cerostraca*. The group as a whole is closely allied to the *Eatoniella-Dardanula* group of species but can be distinguished by the following characteristics:

Shell, thin, small, conical; periphery subangled or rounded. Aperture oval, peristome thin, outer lip depressed suddenly posteriorly and retracted below this portion, rest of lip nearly straight, simple, thin. At point of depression behind outer lip there is a swelling, which may be strong forming a varix-like structure, or weak and hardly noticeable. Colour dark or pale with dark spots.

Species of this subgenus can be distinguished from *Dardanula* by their characteristic thin shells, weakly thickened peristome and apertural features.

Animal: Similar to that of some *Dardanula* species in having a single right opercular tentacle, but there is a distinct, small, group of white gland cells on the left lobe as seen in *Abscindostoma* and *Pellax*.

Operculum: Oval, yellow, muscle insertion area extensive, no internal ridge, peg short and solid. Colour yellowish.

Radula: Shape of teeth typical. Central 3 + 1 + 3, lateral 2 + 1 + 3, inner marginal 3 + 1 + 1, outer marginal finely serrate.

Eatoniella (Cerostraca) bathami n. sp. Plate 9, figs 9, 10.

Shell, small, conical, rather large for subgenus, moderately solid, smooth, shining, variable in colour. The spire with 4 weakly convex whorls; protoconch smooth, not marked off; sutures weakly incised, false margined; body whorl large, periphery slightly angled, base convex. Surface smooth except for faint growth lines, also a few very faint spiral scratches visible. Aperture large, rounded, slightly angled above, peristome thickened. Outer lip excavated below, produced forward

posteriorly where it is bent downwards. A slight swelling just behind outer lip and in the upper quarter of whorl, is only indication of characteristic varix-like thickening of subgenus. Columella moderately thick, concave, inner lip partly covering a small umbilical chink. Colour variable, usually dark greyish-purple to pale grey or yellowish white. Holotype pale greyish with a purple tinge. A diffuse white band below the periphery is often present and, in the holotype, is visible on the body whorl. Body whorl usually paler in colour than rest of shell, and a distinct white patch around umbilical area.

Specimens vary considerably in colour, size and shape. Small shells are usually broad, large shells often narrow. In some populations most shells are white (e.g. in algae, Halfmoon Bay, Stewart Island), while in others there are no white individuals (e.g. type series).

Animal: (Halfmoon Bay, Stewart Island). External parts unpigmented (preserved material).

Operculum: (Fig. 10). Oval, slightly curved, yellowish-white, growth lines hardly visible, marginal areas narrow. Peg short, wide. Muscle insertion area extensive, dense.

Radula: Very similar to that of *E.* (*C.*) *delli*. Central 3 + 1 + 3, the outermost cusp very minute. Lateral 2 + 1 + 3; inner marginal 3 + 1, the outermost denticle largest. Outer marginal finely serrate.

Holotype: (Fig. 9). Little Papanui, Dunedin, on gelatinous red algae, 5/9/63, W.F.P. (A.M.).

Height 1.42 mm. Width 0.8 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; Taylor's Mistake., Bank's Peninsula, coralline algae, -/8/63 (W.F.P.); Little Papanui, Dunedin, coralline algae, under stones, 5/9/63 (W.F.P.); Taieri Beach, Otago, algae, Finlay Coll. (A.M.); Halfmoon Bay, Stewart Island, algae, E. Smith, 12/6/52 (W.F.P.); 8 fathoms off mouth of Halfmoon Bay, Stewart Island, clean algae, -/4/59 (Smith Coll.); Harolds Point, Stewart Island, algae, 18/9/56 (Smith Coll.); Ringaringa, Nugget Point, Stewart Island, algae (Smith Coll.).

Distribution: The East Coast of the South Island and Stewart Island, living on algae.

This species is named after Dr E. J. Batham, in appreciation of her kindness and valuable assistance during my stay at the Portobello Marine Biological Station.

Eatoniella (Cerostraca) delli n. sp. Plate 9, figs. 2-6.

Shell minute, dark purplish, conical, smooth. Whorls 4½, slightly convex, sutures moderately impressed. Protoconch smooth, not marked off. Sutures false-margined by a dark band. Body whorl subangled at periphery, base flatly convex. Colour purplish, the protoconch pale yellow, semi-transparent, aperture grey. Aperture oval, angled anteriorly and posteriorly; columella strongly concave; umbilical chink very small; outer lip much retracted, bent forwards posteriorly and reflected at edge. A weak, varix-like swelling a little behind outer lip.

E. (C.) delli differs from the type species (Pl. 7, fig. 1, 1a) by its shorter spire, larger aperture and weaker 'varix'. Shells show considerable variation in size, shape (c.f. figs. 2 and 3) and colour and it is possible that they belong to more than one species. Shells with white markings are sometimes encountered.

Animal: (Fig. 4). (Leigh). Cephalic tentacles colourless, long, active. Snout bilobed, short, black on sides and dorsally; buccal mass yellow, showing through integument. Eyes rather small, on slight swellings, at bases of tentacles and visible beneath transparent edge of shell. Opercular lobe black, with or without a short tentacle on left side, with a small group of mucous cells on right side. Foot long, bluntly rounded anteriorly, with a small anterior mucous gland. Posterior mucous gland large, opening into a long slit extending from middle of sole to posterior end.

Operculum: (Fig. 5). Thickened, slightly curved, yellowish. Muscle insertion area extensive, opaque, columella edge a raised rim. Peg short and solid. Marginal area is moderately wide. Faint growth lines are the only sculpture.

Radula: (Fig. 6). Typical of the genus. Central 3 + 1 + 3, lateral 2 + 1 + 3, with a strong basal thickening and a weaker dorsal rib. Inner marginal 3 + 1 + 1, the denticles of similar size, though fourth a little larger; outer marginal with fine serrations.

Holotype: (Figs. 2, 2a). Bream Tail, in Corallina (W.F.P.), 21/8/63 (A.M.).

Height 1.24 mm. Width 0.73 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; North Cape, small algae, W. R. B. Oliver, 26/11/16 (D.M.); Spirits Bay, algae, W. R. B. Oliver, 1889 (D.M.) and shell sand (Hipkins Coll.); Taupo Bay, Whangaroa, E. R. Richardson, 11/4/51 (D.M.); and 2/1/54 (Hipkins Coll.); Cavalli Islands, Whangaroa, algae, -/6/52 (D.M.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.) and algae, 22/5/63 (W.F.P.); Smuggler's Bay, Whangarei Heads, *Carpophyllum plumosum*, 6/5/62 (W.F.P.); Ocean Beach, Whangarei Heads, red algae, 7/5/62 (W.F.P.); Poor Knights Islands, under vermetid masses, coralline algae and brown algae, 4/4/64 (W.F.P.); Bream Tail, under stones, *Carpophyllum* spp., 12/8/63 (W.F.P.); Goat Island Bay, Leigh, under stones, *Corallina*, various algae, 1962-64 (W.F.P.); Tryphena Bay, Great Barrier Island, -/1/51 (Hipkins Coll.); Kaitoke, Great Barrier Island, coralline algae and short algae, 16/11/63 (W.F.P.); Okupu, Great Barrier Island, *Corallina*, fine brown algae in pool, -/11/63 (W.F.P.) Takapuna, Auckland, *Corallina*, brown algae, 1962-64 (W.F.P.); Muriwai, under stones, coralline algae, 19/8/63 (W.F.P.); Piha, various algae, 1962-63 (W.F.P.); 1 mile West of Cornwallis, Manukau Harbour, brown algae, clean coralline algae, 7/1/62 (W.F.P.); Jackson's Bay, Coromandel, under stones, fine red algae, 2/3/64 (W.F.P.); Sandy Bay, Coromandel, *Corallina*, 30/3/64 (W.F.P.); Stony Bay, Coromandel, *Corallina*, other small algae, 28/3/64 (W.F.P.); Tolaga Bay, shell sand, R. K. Dell, 28/11/50 (D.M.); Day's Bay, Wellington Harbour, 11/12/61 (W.F.P.); Lyall Bay, Wellington, *Cystophora*, W. R. B. Oliver, 18/12/21 (D.M.); Island Bay, Wellington, *Corallina*, *Caulerpa*, brown algae, 3/6/62 (W.F.P.); Owhiro Bay, Wellington, *Corallina*, brown algae, 6/5/62 (W.F.P.); Titahi Bay, *Corallina*, 5/6/62 (W.F.P.); Karehara Bay, Plimmerton, *Xiphophora*, 7/12/61 (W.F.P.); Kaikoura, fine brown algae, P. Luckens, 12/8/64 (W.F.P.); Taylor's Mistake, Bank's Peninsula, coralline algae, W. R. B. Oliver, 10/4/10 (D.M.) and

coralline algae, -/8/63 (W.F.P.); East of Purau, Lyttelton Harbour, fine brown weed and fine coralline algae in pools, W. R. B. Oliver, 4/9/10 (D.M.); Gollan's Bay, Lyttelton Harbour, rock pools, W. R. B. Oliver, 6/4/07 (D.M.); Okain's Bay, Bank's Peninsula, W. R. B. Oliver, 10/11/06 (D.M.).

Distribution: North Island and the North East of the South Island, at low tide.

Ecology: This minute species prefers finely divided algae in which to live, but is also found on large algae and under stones.

I have much pleasure in naming this species after Dr R. K. Dell in appreciation of his invaluable advice and assistance during the course of these investigations, and for his early patient tutoring and encouragement.

Eatoniella (Cerostraca) maculosa n. sp. Plate 9, fig. 7.

Shell similar to *E.* (*C.*) *delli* n. sp., but a little larger, with a more rounded periphery, generally broader shell, different coloration, and weaker varix. The colour varies from yellowish-brown to dark purplish-grey. In the holotype there is a dark purplish band below the sutures on the periphery, and on the middle part of the base. A row of irregular dark blotches, often alternating with small white blotches, replaces the band in many paratypes.

Also similar to *E.* (*C.*) *tenella* (Powell), the new species differs in its smaller size and variable colour pattern.

Animal: As in *E.* (*C.*) *delli* n. sp., but with more intensely black opercular lobes. Opercular tentacle short, on the left lobe, black, a distinct group of mucous cells on right lobe. Proximal end of the snout, dorsal part of head and anterio-dorsal part of foot, are black. Rest of exposed animal yellowish, sole white.

Operculum: Similar to that of *E.* (*C.*) *delli*. Yellowish, curved, semi-transparent, peg broad and flattened. Marginal areas narrow. Fine growth lines and subobsolete spirals present. Insertion area yellowish-white, rather dense.

Radula: Similar to that of *E.* (*C.*) *delli*. Central 3 + 1 + 3, the outermost cusp very small. Lateral 2 + 1 + 3, the outer cusp very small, inner marginal 3 + 1 + 1, outer marginal finely serrate.

Holotype: (Fig. 7). MacGregor's Bay, Whangarei Heads, on various algae, 22/5/63, W.F.P. (A.M.).

Height 1.48 mm. Width 0.875 mm.

Paratypes: Auckland and Dominion Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; Big King, Three Kings Islands, sublittoral algae, A. Baker, (W.F.P.); Spirits Bay, shell sand (Hipkins Coll.); Ocean Beach, red algae, *Carpophyllum maschalocarpum*, various small algae, under stones, 9/4/55 (W.F.P.); MacGregor's Bay, shell sand, 9/4/55 (Hipkins Coll.); MacGregor's Bay, algae, J. Wakeman, -/8/62 (W.F.P.); Shoal Bay, Great Barrier Island, algae (Hipkins Coll.).

Distribution: The East Coast of the North Island, North of Whangarei, and Great Barrier Island, in exposed situations on algae.

The *Cerostraca* group is difficult because the species are very variable and hard to define, when material from a wide geographical range is considered. There are probably more than two common species in the North Island, *maculosa* being applied to relatively large shells, with or without a colour pattern, and *delli* to small shells that are usually black, but sometimes have white markings. This situation is almost certainly a simplification.

Eatoniella (Cerostraca) tenella (Powell). Plate 9, fig. 8.

1936 *Dardanula tenella* Powell, Discov. Rep. 15, p. 203, pl. 53, fig. 15.

This poorly known species is tentatively placed in *Cerostraca* by virtue of its thin shell, shape, apertural features and coloration. The shell is redescribed below to facilitate identification, and for comparison with related species.

Shell thin, shining, imperforate, with faint growth striae and very fine spiral scratches. Spire broadly conical, whorls 4½, lightly convex, false margined; protoconch smooth, not marked off; periphery subangled. Aperture round, peristome thin, inner lip concave, separated from base below; outer lip sharp, bent down a little posteriorly, slightly flanged all round. Colour pale yellowish, yellowish-brown or pale pink, with dark reddish-brown or brown zig-zag markings over base and as spots below sutures, these alternating with pure white spots. Basal markings often break up into basal and peripherial series of spots. Colour pattern basically constant, though a little variable in detail.

Though related to *E. (C.) maculosa* n. sp., it is larger in size, proportionately broader, with a rather different, more constant, colour pattern.

Animal, operculum and radula unknown.

Holotype: Discovery II Stat. 934, off Three Kings Islands, 92 metres, (Brit. Mus.).

Height 2.1 mm. Width 1.3 mm. (from Powell)

Material Examined: Paratypes (A.M.); N.Z.O.I. Stat. C.760 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, bryozoan substrate, 18/2/62 (O.I.).

Distribution: Off Three Kings Islands.

Subgenus **Dardaniopsis** n. subgen.

Type: *E. (D.) notalabia* n. sp.

Shell: Small, ovate-conical, thin, semi-transparent. Outer lip bisinuate. Colour variable.

Animal: Two opercular tentacles, one on each lobe.

Operculum: Muscle insertion area only in columella half of operculum, bordered on its outer edge by a ragged line. No internal ridge.

Radula: Central 2 - 3 + 1 + 2 - 3, lateral 2 + 1 + 2 - 3, inner marginal 4 - 7 denticles, outer marginal typical.

Eatoniella (Dardaniopsis) notalabia n. sp. Plate 8, figs. 1-4.

Shell, minute, ovate-conical, body whorl swollen, aperture large and bisinuate. Spire slightly convex, of $3\frac{1}{2}$ whorls; protoconch not marked off, smooth, semi-transparent. Adult whorls lightly convex, semi-transparent, purplish-brown in holotype, though colour varies from yellowish-brown to black; distinctly false margined. Base and periphery rounded. Peristome continuous, inner lip thin, outer lip strongly retracted, bisinuate, a notch in middle and anteriorly. Columella concave, a tiny, shallow, umbilical chink present. Peristome encircled with black, especially on the outer lip. There is some variation in size and colour.

The small size, notched, black-rimmed outer lip and thin, dark-coloured, semi-transparent shell make this species most distinctive.

Animal: (Leigh). (Fig. 2). Typical of the subgenus. Cephalic tentacles long, mobile, protruding from the notches in the outer lip of the shell. Eyes visible beneath transparent rim of the shell, in swellings on outer bases of the cephalic tentacles. Foot rather short, bluntly rounded anteriorly. Anterior mucous gland poorly defined but posterior large and opens into a slit which extends from middle of sole to posterior end. Snout short, bilobed. Two long opercular tentacles, left longest. Colour white except for narrow strip of black around edges of opercular lobe and on back of head.

Specimens from Piha on the West Coast of Auckland have uniform white animals and smaller shells, but otherwise they are identical with the east coast form.

Operculum: (Fig. 3). Moderately thickened, oval, columella edge weakly convex. No internal ridge. Muscle insertion area small, dense white, terminating some distance from outer edge as a ragged line, a raised rim along the columella side. Peg strong and grooved. Operculum except for the insertion area, semi-transparent and pale yellow in colour.

Radula: (Fig. 4). Central 3 + 1 + 3. Lateral 2 + 1 + 3, thickened below. Inner marginal denticles 4 + 1 + 1, the fifth a little larger. Outer marginal with about 6 serrations and a broad basal area.

Holotype: (Fig. 1). Goat Island Bay, Leigh, on *Carpophyllum plumosum,* 1/1/64 (W.F.P.) (A.M.).

Height 1.26 mm. Width 0.8 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, and the N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotypes and paratypes; Big King, Three Kings Islands, sublittoral algae, A. Baker (W.F.P.); Spirits Bay, shell sand (Hipkins Coll.); Takapau Kura, Spirits Bay, algae, A. W. B. Powell, -/8/33 (Powell Coll.); Cape Maria van Diemen, Finlay Coll. (per N. H. Odhner) (A.M.); Whangaroa, shell sand, R. K. Dell (D.M.); Taupo Bay, Whangaroa, E. R. Richardson 11/4/51 (D.M.); Poor Knights Islands, hard coralline algae, brown algae 4/4/64 (W.F.P.); MacGregor's Bay, Whangarei Heads, algae, 22/5/63 (W.F.P.); Ocean Beach, Whangarei Heads, red algae, *Carpophyllum maschalocarpum* and various small algae, 9/5/63 (W.F.P.); Kaitoke, Great Barrier Island, short algae, 16/11/63 (W.F.P.); Goat Island Bay, Leigh, *Carpophyllum* and other brown algae, 1962-64 (W.F.P.); North and South Piha, West Coast, Auckland, short soft algae, coralline algae.

-/6/63 (W.F.P.); Jackson's Bay, Coromandel, *Carpophyllum plumosum,* 29/3/64 (W.F.P.); Ohope, *Carpophyllum,* M. West, 24/8/64 (W.F.P.); Cape Runaway, A. W. B. Powell, -/8/33 (Powell Coll.); Tolaga Bay, R. K. Dell, 28/11/50 (D.M.) Lyall Bay, Wellington, *Cystophora,* W. R. B. Oliver, 18/12/21 (D.M.), and Finlay Coll. (A.M.); East side of Lyall Bay, algae, 17/2/56 (W.F.P.); Island Bay, Wellington, algae (D.M.); Titahi Bay, brown algae (W.F.P.); Brothers Island, Cook Strait, algae in several feet of water, D. Hurley -/5/51 (D.M.); Kaikoura, small algae, I. Mannering, -/8/63, and fine brown algae, P. Luckens, 12/8/64 (W.F.P.); Motunau Beach, Canterbury, coralline algae, R. R. Forster, 17/1/48 (D.M.); Taylor's Mistake, Bank's Peninsula, coralline algae, *Cystophora,* W. R. B. Oliver, 10/4/10 (D.M.); East of Purau, Lyttelton Harbour, fine brown algae and fine coralline algae in rock pools, W. R. B. Oliver, 4/9/10 (D.M.); Okain's Bay, Bank's Peninsula, W. R. B. Oliver, 10/11/06 (D.M.); Gollan's Bay, Lyttelton Harbour, brown algae, W. R. B. Oliver, 26/3/10 (D.M.); Shag Point, Otago, *Tiphophora* association, W. R. B. Oliver, 18/1/01 (D.M.); Ships' Channel side of Quarantine Island, Dunedin Harbour, brown algae, 4/9/63 (W.F.P.); Little Papanui, Dunedin, coralline algae, under stones, gelatinous red algae, 5/9/63 (W.F.P.); Taieri Beach, Otago, algae, Finlay Coll. (A.M.); Halfmoon Bay, Stewart Island, O. Allan (D.M.), and algae, E. Smith 12/6/52 (W.F.P.); Aker's Point, Halfmoon Bay, M. Spong, 22/2/63 (W.F.P.); Ocean Beach, Stewart Island, algae, 28/12/52 (Smith Coll.); Harold's Point, Stewart Island, *Corallina,* 18/9/56 (Smith Coll.); Nugget Point, Stewart Island, algae, 17/9/56 (Smith Coll.); Bathing Beach, Stewart Island, O. Allan, 1950 (D.M.); Doubtful Sound, 50 fathoms (W.F.P.); Open Bay Islets, West Coast, J. A. Bollons, (D.M.); Faith Harbour, Auckland Islands, M. K. Mestayer (A.M.); Faith Harbour, beach drift (A.M.); Chatham Islands, Exped., Stat. 11, Owenga, Chatham Islands, algae, R. K. Dell, 26/1/54 (D.M.); Red Bluff, Chatham Islands, W. R. B. Oliver, 6/12/09 (D.M.); Waitangi, Chatham Islands, algae, W. R. B. Oliver, -/12/09 (D.M.).

Distribution: The East and West Coasts of the North and South Islands, Stewart Island, and the Auckland and Chatham Islands, on algae at low tide.

Ecology: Inhabits clean algae on open coasts. It is particularly abundant in the South Island and Stewart Island.

Eatoniella (Dardaniopsis) globosa n. sp. Plate 8, fig. 8.

Shell thin, fragile, inflated, pinkish, semi-transparent. Whorls three, weakly convex, false margined, with subobsolete spiral scratches. Protoconch dome-shaped, similarly sculptured to the adult whorls, from which it is not marked off. Body whorl comprises most of shell, globose; a weak spiral ridge runs around the convex periphery. Umbilicus large, deep, crescentric, surrounded by a sharp ridge. Aperture pear-shaped, with a slightly thickened, strongly retracted, outer lip which has two chinks, one in middle, other posteriorly. Peristome continuous, rather thin, columella very slightly concave. Colour of first two whorls yellowish brown, the rest pinkish. Umbilical region, columella, and outer lip bright pinkish.

This species is clearly related to *E. (D.) notalabia,* but at the same time is most distinctive. Animal, operculum and radula unknown.

Holotype: (Fig. 8). Spirits Bay, 1949 (ex Hipkins Coll.) (A.M.).
Height 1.15 mm. Width 0.8 mm.

Paratypes: Auckland and Dominion Museums, N.Z. Geological Survey, Lower Hutt, K. Hipkins Collection.

Material Examined: Holotype and paratypes; MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.).

Distribution: The North and North East of the North Island.

Eatoniella (Dardaniopsis) pullmitra n. sp. Plate 8, figs. 9-11.

Shell, minute, smooth, shining, broadly ovate, with a short, swollen spire. Spire slightly convex, of 4 whorls. Sculpture of weak growth lines. Protoconch small, smooth, depressed, not clearly marked off, adult whorls very rapidly increasing, convex; body whorl globose, base convex. Aperture small, oval, angled above and slightly below; peristome continuous; inner lip concave, slightly thickened, narrow, not covering the large umbilicus; outer lip slightly thickened above and below, notched in its middle and anteriorly, slightly reflected anteriorly. Umbilicus large, deep, wide, bordered by a faint ridge. Colour yellowish-white, semi-transparent, aperture and umbilical area white.

Though superficially similar to *E. (D.) atervisceralis* n. sp. and *E. (Dardanula) dilatata* (Powell), this species is easily distinguished by its broad shell and large umbilicus.

Animal: (Paratype). Visceral mass and mantle roof yellowish, head snout, sides of the foot, and opercular lobes black. Eyes small (preserved material).

Operculum: (Fig. 10). Oval, thin, nearly flat. Peg short, grooved and dense yellowish-white. Muscle insertion area semi-transparent but thickened and rough, yellowish-white, broken a considerable distance from outer edge in a ragged line. Outer area is colourless and transparent.

Radula: (Fig. 11). Typical of the genus. Central 2 + 1 + 2, lateral 2 + 1 + 2, with a strong basal process and dorsal rib. Inner marginal 3 + 1, the outermost cusp strong. Outer marginal with about 6 serrations and a broad base.

Holotype: (Fig. 9). Ships' Channel side of Quarantine Island, on soft brown algae, 4/9/64 (W.F.P.) (A.M.).

Height 1.23 mm. Width 0.85 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; Big King, Three Kings Islands, sublittoral algae, A. Baker (W.F.P.); Spirits Bay, shell sand (Hipkins Coll.); 4 fathoms between Cape Maria Island and mainland, -/2/61 (Hipkins Coll.); Brother's Island, Cook Strait, sublittoral algae, D. E. Hurley, -/5/51 (D.M.); Gollan's Bay, Lyttelton Harbour, brown algae, W. R. B. Oliver, 26/3/10 (D.M.); Portobello, Dunedin Harbour, *Corallina*, soft red algae, 3/9/63 (W.F.P.); Ships' Channel side of Quarantine Island, Dunedin Harbour, *Corallina*, 4/9/63 (W.F.P.); Portobello, Dunedin Harbour, 2-3 fathoms on algae, 3/9/63 (W.F.P.); Foveaux Strait, 1951 (Smith Coll.); Butterfield's Beach, Stewart Island, shell sand, O. Allan, -/10/47 (W.F.P.); Bathing Beach, Stewart Island, shell sand, O. Allan, 1950 (W.F.P.); 10 fathoms off Native Island, Stewart Island, algae, -/12/58 (Smith Coll.); 25 fathoms off Port Adventure, Stewart Island, fine bryozoans, -/6/58 (Smith Coll.); 50 fathoms, Doubtful Sound (W.F.P.); Waitangi, Chatham Islands, rocks between tides, W. R. B. Oliver, -/12/09 (D.M.); Red Bluff, Chatham Islands, W. R. B. Oliver, 6/12/09 (D.M.).

Distribution: The distribution of this species is complicated because of its preference for sublittoral algae. The Far Northern records suggest that it is found throughout the North Island, probably most abundantly in sublittoral algae, but there is no evidence to support this conclusion

apart from the record from Cook strait. *E. (D.) pullmitra* is found commonly in the littoral zone in Dunedin Harbour, but at Stewart Island it has only been recorded from the sublittoral. Only dead shells have been found at the Chatham Islands.

Eatoniella (Dardaniopsis) varicolor n. sp. Plate 8, figs. 5-7.

Shell of medium size for genus, ovate, conic, smooth, variable in colour, imperforate, outer lip strongly reflected and bisinuate laterally. Spire rather short, of 4 lightly convex whorls. Protoconch small, smooth, varying from pink to purple, not distinctly marked off, often coloured darker than the spire. Aperture rather large, columella concave, inner lip thickened; outer lip thin anteriorly, thickened posteriorly, the thin anterio-lateral portion bisinuate. Inner lip and umbilical area pinkish in holotype, spire yellowish-brown. Colour, however, highly variable, even within one population, this appearing to be a characteristic of the species. Dark purple, black, orange, very pale yellow, colourless, plain and banded shells are found together. The most common colour is pale brownish-yellow.

E. (D.) varicolor resembles *E. (A.) lutea* (Suter), and the two species are frequently found together. The new species is readily distinguished by its smaller size, thinner shell, sinuate aperture, different coloration, and particularly the dark protoconch and the inner lip which is frequently pinkish. *E. (A.) lutea* usually has a uniform coloration. Some specimens have pink bands and superficially resemble *E. (Dardanula) roseocincta* (Suter). It could also be confused with *E. (Dardanula) roseospira* (Powell) by virtue of its dark protoconch, but that species is smaller, with an evenly convex outer lip.

Animal: (Fig. 6). (Paratype). Typical of the subgenus. Cephalic tentacles colourless, mobile and protrude from the dents in aperture; eyes remain below transparent rim of shell. Snout bilobed, short, with a golden tinge; buccal mass orange-red. Rest of animal yellowish-white, except for outer margins of opercular lobes and lateral margins of foot, which are black, and the white sole. Posterior mucous gland large, opening into a slit which extends from centre of sole to posterior end. Two long opercular tentacles, one on each side, the left longest.

Operculum: On retracted animal appears to have black edges owing to pigmentation of opercular lobes. Oval, thickened, muscle insertion area small, terminated by an irregular line some distance from outer edge and bordered by a raised rim on columella edge. Peg strong, curved, and grooved. Sculpture of strong growth lines and fine spirals.

Radula: Typical of the genus. Central 2 + 1 + 2, lateral 2 + 1 + 3, the cusps weak; with a strong basal and dorsal ridge. Inner marginal with 3 tiny denticles on either side of a weak, broad cusp. Outer marginal finely serrate.

Holotype: Narrow Neck Reef, on *Carpophyllum plumosum* in rock pools, W.F.P., 27/3/63 (A.M.).

Height 1.73 mm. Width 1.13 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; Great Island, Three Kings Islands, sublittoral algae, A. Baker (W.F.P.); Spirits Bay, shell sand (Hipkins Coll.); Taupo Bay, Whangaroa, E. R. Richardson, 11/4/51 (D.M.) and 2/1/54 (Hipkins Coll.); Tapeka Point, Russell, -/1/55 (Hipkins Coll.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.); Goat Island Bay, Leigh, brown algae, 1963-64 (W.F.P.); Tawaharanui Point, North side, brown algae, in pools on papa platform, 31/12/63 (W.F.P.); Brown's Bay, Auckland, brown algae, 19/1/64 (W.F.P.); Takapuna, Auckland, *Carpophyllum plumosum,* 27/3/63 (W.F.P.); Narrow Neck, Auckland, *Carpophyllum* spp., 26/3/63 (W.F.P.); Sandy Bay, Coromandel, brown algae, 30/3/64 (W.F.P.); off Mayor Island, in fish stomach contents, G. Williams (Powell Coll.); Tolaga Bay, shell sand, R. K. Dell, 28/11/50 (D.M.); Kaiti Beach, Gisborne, R. K. Dell, 26/11/50 (D.M.); Lyall Bay, *Cystophora,* W. R. B. Oliver, 18/12/21 (D.M.); Island Bay, Wellington, brown algae, *Corallina,* 3/6/63 (W.F.P.); Scorching Bay, Wellington, brown algae, 26/11/61 (W.F.P.); between Pukerua Bay and Plimmerton, on algae holdfasts washed ashore, 18/6/60 (W.F.P.); Brother's Island, Cook Strait, sublittoral algae, D. H. Hurley, -/5/51 (D.M.); East of Diamond Harbour, Lyttelton Harbour, *Corallina,* brown algae, under stones, -/9/63 (W.F.P.); Taylor's Mistake, Bank's Peninsula, coralline algae, W. R. B. Oliver, 10/4/10 (D.M.); Ships' Channel side, Quarantine Island, Dunedin Harbour, fine red algae, 4/5/63 W.F.P.); Portobello, Dunedin Harbour, brown algae, 3/9/63 (W.F.P.); Bluff Harbour, *Corallina,* M. Spong, 27/5/63 (W.F.P.); Bathing Beach, Stewart Island, O. Allan, 1950 (D.M.); Nugget Point, Stewart Island, algae, 17/9/56 (Smith Coll.); 8 fathoms, off mouth of Halfmoon Bay, Stewart Island, clean algae, 16/4/59 (Smith Coll.); Doubtful Sound, 50 fathoms (W.F.P.); Open Bay Islets, West Coast, J. A. Bollons (D.M.); Chatham Island Expedition, Port Hutt, Chatham Island, 8/2/54 (D.M.).

Distribution: The East Coasts of the North and South Islands, the South West Coast of the South Island, and Stewart Island. The single record from the Chatham Islands need confirmation.

Ecology: *E.* (*D.*) *varicolor* prefers brown algae as a habitat, though it is sometimes encountered in *Corallina. Carpophyllum plumosum* is preferred to *C. maschalocarpum* at Takapuna and Narrow Neck. This species is encountered in immense numbers on *C. plumosum* in moderately sheltered situations, such as rock pools, at Takapuna, Narrow Neck, Waiwera and many other localities in the vicinity of Auckland. In more exposed situations it is replaced by *E.* (*A.*) *lutea,* while in silted localities *E.* (*D.*) *limbata* (Hutton) and *E.* (*D.*) *olivacea* (Hutton) dominate. There is some evidence that it is abundant below low tide level through most of New Zealand.

Eatoniella (Dardaniopsis?) atervisceralis n. sp. Pl. 8, figs. 12-15.

Shell minute, conical, smooth, shining, with convex whorls, transparent. Whorls 4½, strongly convex; protoconch not marked off, small. Sculpture absent except for slightly oblique growth lines, these sometimes strong. Sutures indistinctly false margined. Body whorl large, inflated. Aperture oval, slightly angled posteriorly; peristome continuous, fairly thin; inner lip evenly concave, narrow, columella nearly vertical. Outer lip slightly retracted, evenly convex, hardly thickened. Umbilicus a small chink, but deep and definite and always present. Colour yellowish-white, aperture and lower part of base white.

There is some variation in size and in the relative height of the spire (c.f. figs. 12 and 13). This species can be distinguished from *E.* (*D.*) *pullmitra* which it closely resembles, by its smaller umbilicus, evenly convex outer lip, taller spire, and the colour of the animal. It can be separated from *E.* (*Dardanula*) *dilatata* (Powell), which it super-

ficially resembles, by the narrow inner lip which does not cover the umbilicus, and the oval, rather than obliquely D-shaped, aperture, of which the columella is nearly vertical, and the peristome rounded, instead of angled, where it meets the outer lip below. Also the body whorl is less swollen in most specimens of *aterviscerali*s.

Animal: (Portobello, Dunedin). The visceral mass and mantle cavity roof are pigmented with large, irregular, close black blotches or are uniform jet-black. The head and foot are unpigmented (preserved material). The black visceral mass can be easily seen in dried material that has been collected alive, thus facilitating identification.

Operculum: (Fig. 14). Oval, fairly thick, slightly curved. Muscle insertion area transparent, not greatly thickened, but rough, pale yellowish and broken irregularly some distance from outer edge which is clear and colourless. Peg of moderate length, yellowish, curved. Nucleus fairly clearly defined and rather large for genus.

Radula: (Fig. 15). Typical of genus. Central 2 + 1 + 2, lateral 2 + 1 + 2, with a strong basal rib; inner marginal 1 + 1 + 2, the second denticle rather weak, outer marginal finely serrate.

Holotype: (Fig. 12). Lonneker's Bay, Stewart Island, in coralline algae at low tide, -/10/51 (ex Smith Coll.) (A.M.).

Height 1.23 mm. Width 0.75 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt and E. Smith Collection.

Material Examined:

Holotype and paratypes; Spirits Bay, shell sand, (Hipkins Coll.); Taupo Bay, Whangaroa, shell sand, 2/1/54 (Hipkins Coll.); Poor Knights Islands, under stones in pools, 4/4/64 (W.F.P.); Mokohinau Islands (W.F.P.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.); Smuggler's Bay, Whangarei Heads, under stones, 21/5/63 (W.F.P.); Goat Island Bay, Leigh, under stones, 1/1/64 (W.F.P.); Jackson's Bay, Coromandel, under stones, 30/3/54 (W.F.P.); Shag Point, Otago, *Tiphohora,* association, W. R. B. Oliver, 18/1/01 (D.M.); Little Papanui, Dunedin, coralline algae, 5/9/63 (W.F.P.); Portobello, Dunedin Harbour, *Corallina* and soft red algae, 3/9/63 (W.F.P.); Ships' Channel side, Quarantine Island, Dunedin Harbour, *Corallina,* 4/9/63 (W.F.P.); Taieri River Mouth, coralline algae, W. Ballantine, 27/6/64 (W.F.P.); Taieri Beach, algae, Finlay Coll., (A.M.); Bluff Harbour *Corallina,* M. Spong, 27/5/63 (W.F.P.); Aker's Point, Halfmoon Bay, Stewart Island, under stones, M. Spong, -/2/63 (W.F.P.); Butterfields Beach, Stewart Island, shell sand, O. Allan, -/10/47 (D.M.); Ocean Beach, Stewart Island, R. K. Dell, 31/10/48 (D.M.) and 1/12/52 (Smith Coll.); Lonneker's Bay, Stewart Island, algae below first line of *Durvillea,* -/3/57 (Smith Coll.); Paterson Inlet, algae, 15/9/56 (Smith Coll.); Waitangi, Chatham Islands, rocks between tides, W. R. B. Oliver, -/12/09 (D.M.); Chatham Island Exped. Stat. 16, Kaingaroa, 27/1/54 (D.M.).

Distribution: The East Coasts of the North and South Islands, Stewart Island and the Chatham Islands, living in turf-algae and under stones from low tide to a few fathoms. It is much more abundant in the South. Apparently this species has escaped notice in many localities because of its small size and inconspicuous shell.

*E. aterviscerali*s is placed only tentatively in *Dardaniopsis* as the aperture has an even outer margin. Examination of the living animal should help fix its taxonomic position.

Subgenus **Dardanula** Iredale, 1915.

(Nom. nov. pro *Dardania* Hutton, 1882, non Stal, 1860).

Type (monotypy) : *Dardania olivacea* Hutton, 1882.

Several New Zealand eatoniellids are similar to the type of *Dardanula,* but show, as a group, several small, but constant, differences from *Eatoniella* (s.s.). The group appears to form a fairly natural subgenus of *Eatoniella* but certainly does not deserve full generic rank.

Shell: Solid, conical, usually opaque. Protoconch opaque, of same colour as adult shell. Whorls weakly to moderately convex. Aperture solid, ovate to D-shaped, inner lip heavy, outer lip straight or excavated, simple, thickened, and bent downwards slightly posteriorly. Usually not umbilicate.

Animal: Opercular tentacles absent or one on left lobe. Right lobe with no definite group of mucous cells.

Operculum: Solid, muscle insertion area extensive, opaque, only a small area to left of peg sometimes transparent. Internal ridge present or absent. Spiral sculpture weak or absent. Colour black, brown or yellowish.

Radula: Shape of teeth typical. Central typically 2 + 1 + 2 (but 3 + 1 + 3 in two species), lateral 2 + 1 + 2, inner marginal 3 in the majority of species, (1 in one species, 5 and 6 in two other species) outer marginal finely serrate.

Eatoniella (Dardanula) olivacea (Hutton). Plate 5, figs. 1-7.

1882 *Dardania olivacea* Hutton, Trans. N.Z. Inst., 14, p. 147, pl. 1, fig. K, 1-4.
1884 *Rissoina olivacea* var. *annulata* Hutton, N.Z. Journ. Sci. 2, p. 173.
1898 *Rissoina olivacea* (Hutton); Suter, Proc. Mal. Soc. Lond., 3, p. 7.
1905 *Rissoina olivacea* (Hutton); Webster, Trans. N.Z. Inst., 37, (1904), (1905), p. 279, pl. 10, fig. 9, a.
1905 *Rissoina olivacea* var. *annulata* Hutton; Webster, Trans. N.Z. Inst. 37, p. 279.
1913 *Rissoina* (*Eatoniella*) *olivacea* (Hutton); Suter, Man. N.Z. Moll. p. 225, pl. 13, fig. 19.
1913 *Rissoina* (*Eatoniella*) *olivacea* var. *annulata* Hutton; Suter, Man. N.Z. Moll. p. 226, pl. 13, fig. 19.
1915 *Dardanula olivacea* (Hutton); Iredale, Trans. N.Z. Inst., 47, p. 454.
1937 *Dardanula olivacea annulata* (Hutton); Powell, Shellfish of N.Z. p.70.

Specimens labelled as cotypes of *Dardanula olivacea* in the Canterbury Museum (fig. 3) do not match shells from the type locality (Lyttelton Harbour) nor do they resemble cotypes in the Dominion Museum. The latter types do match Lyttelton Harbour shells and it is clear that these represent a portion of Hutton's type material. A specimen selected from these is designated as lectotype (fig. 1) and described below.

Shell conic, solid, imperforate, outlines of spire straight, whorls very slightly convex; protoconch small, not marked off, smooth. Colour purplish-black, columella white over central part, outer lip lighter in colour than rest of shell. Aperture oval, angled posteriorly; outer lip hardly reflected, slightly thickened; columella and inner lip moderately thickened. Periphery subangled.

The species shows considerable variation. Shells in the North can be, on the whole, separated into two size forms. A small variety (fig. 2,

3), with convex whorls, a short spire, (about 1.6-2 mm. high) inflated body whorl and weakly angled periphery, which is by far the commoner of the two forms. The larger form (fig. 4) (about 2.88 mm. high) lives almost exclusively, on brown algae. However shells of intermediate size are fairly common and there is no reasonable indication that these size groups should be separated, as the shells are generally similar and there are no differences in the animal, the operculum, or the radula.

Hutton's var. *annulata* is a variation of *olivacea,* and is particularly abundant in the North East of the North Island. Typical annulate shells belong to the 'small form' already mentioned, and they show every intergradation through uniform black, narrow banded, wide banded and uniform yellow shells. The large form also, rather uncommonly, produces annulate shells. These size forms and the annulate shells do not seem to occur in the southern part of the North Island nor the South Island.

E. olivacea is distinguished from the other species of the genus by its nearly straight apertural margin, dark brown or black operculum, and solid, usually black, shell. The animal too, is distinctive.

Animal: (Auckland). (Fig. 7). Cephalic tentacles long, tapering, actively mobile smooth; eyes in swellings at outer bases. Snout bilobed, short. Foot long, bluntly rounded behind, anterior margin slightly convex, extensile. Mucous slit clearly defined, from middle of sole to posterior end. No opercular tentacles, but an ill-defined group of scattered mucous cells on right opercular lobe, and sometimes a tiny swelling on left lobe which probably represents a rudimentary tentacle. Colour dominantly black, the pigmentation rather dense over most of the exposed parts of the animal. Terminal part of snout white, the orange-red buccal mass visible through the integument. Sole white, cephalic tentacles colourless or "dusted" with black. Notes on the anatomy are given in a forthcoming publication. (Ponder,—a).

The black colour, orange-red buccal mass, and absence of opercular tentacles separate this species from all others of the genus.

Operculum: (Figs. 5, 5a, 5b). Pear shaped, thick, slightly curved, centre dark brown to nearly black, edges black, except columella edge which is brown. Muscle insertion area extensive; peg rather short, curved upwards, thick. Internal ridge rather strong, wide. Growth lines and faint incised spirals visible on outer surface. Inner surface with no sculpture.

Radula: (Fig. 6). Typical of the genus. Central 2 + 1 + 2, marginal 2 + 1 + 2, rather broad, with strong basal ridge and weak ridge on top edge. Marginals typical, inner with three cusps, outer with fine serrations.

Lectotype: (Fig. 1). Lyttelton Harbour (D.M.).
Height 1.88 mm. Width 1.01 mm.

Material Examined:

Lectotype, paralectotypes; Great Island, Three Kings Islands, sublittoral algae, A. Baker (W.F.P.); 4 fathoms, between Cape Maria van Diemen and mainland, -/2/61 (Hipkins Coll.); Spirits Bay, shell sand (Hipkins Coll.); Takapau Kura, Spirits Bay, algae (Powell Coll.); North Cape, small algal formation, W. R. B. Oliver, 24/11/16 (D.M.); Doubtless Bay, A. E. Brookes, Oliver Coll. (D.M.); Waiau Beach, Mangonui, E. R. Richardson, 11/12/50 (D.M.); Whangaroa, Finlay Coll. (A.M.); East of Oneroa, Bay of Islands,

Carpophyllum spp., -/11/62 (W.F.P.); Whangaruru, shell sand, 16/2/56 (D.M.); Ocean Beach, Whangarei Heads, various algae, 7/5/62 (W.F.P.); Smuggler's Bay, Whangarei Heads, various algae, under stones, 5/5/62 (W.F.P.); MacGregor's Bay, Whangarei Heads, algae, under stones, 22/5/63 (W.F.P.); Taurikura Bay, Whangarei Heads, *Corallina*, -/5/63 (W.F.P.); Poor Knights Islands, hard coralline algae, 4/4/64 (W.F.P.); Bream Tail, *Carpophyllum* spp., *Corallina*, 12/8/63 (W.F.P.); Goat Island Bay, Leigh, *Carpophyllum* spp., *Corallina*, small algae, under stones, 1963-64 (W.F.P.); Tawharanui Point, North and South side, brown algae, under stones, 31/12/63 (W.F.P.); Okupu, Great Barrier Island, *Carpophyllum*, under stones, *Corallina*, -/11/63 (W.F.P.); Kaitoke, Great Barrier Island, short algae, under stones, 16/11/63 (W.F.P.); Shoal Bay, Tryphena, Great Barrier Island, algae, 6/1/51 (Hipkins Coll.); Tryphena, Great Barrier Island, shell sand, 13/1/51 (Hipkins Coll.); Waiwera, *Carpophyllum* spp., *Corallina*, 16/2/64 (W.F.P.); Noises Islands, Hauraki Gulf, G. Sadler (Powell Coll.); Brown's Bay, Auckland, brown algae, 19/1/64 (W.F.P.); Campbell's Bay, Auckland, *Caulerpa*, W. Ballantine (W.F.P.); Takapuna, Auckland, *Carpophyllum* spp., *Corallina*, 1962-64 (W.F.P.); Devonport, Auckland, Webster Coll. (Powell Coll.); Point Chevalier Reef, Auckland, Dell Coll. (D.M.); Narrow Neck Reef, Auckland, *Corallina*, *Sargassum*, under stones 1963-64 (W.F.P.); Stanley Point, Auckland, *Sargassum*, 1963 (W.F.P.); St. Heliers Bay, Auckland, Finlay Coll. (A.M.); West Tamaki Heads, *Corallina*, -/8/62 (W.F.P.); Jackson's Bay, Coromandel, *Carpophyllum plumosum*, fine red algae, 29/3/64 (W.F.P.); Sandy Bay, Coromandel, *Corallina*, brown algae, 30/3/64 (W.F.P.); Stony Bay, Coromandel, 28/3/64, brown algae, *Corallina*, short algae, 28/3/64 (W.F.P.); Cornwallis, Manukau Harbour, under stones, *Corallina*, 7/1/62 (W.F.P.); off Mayor Island, fish stomach contents, G. Williams (Powell Coll.); Waihi *Corallina* (W.F.P.); Waihau Beach, Cape Runaway, R. K. Dell, 8/3/62 (D.M.); Cape Runaway, under stones, algae, -/8/33 (Powell Coll.); Tolaga Bay, shell sand, R. K. Dell, 28/11/50 (D.M.); Gisborne, shell sand, 1906 (D.M.); Kaiti Beach, Gisborne, shell, sand, R. K. Dell, 26/11/50 (D.M.); Day's Bay, Wellington Harbour, algae, 11/12/61 (W.F.P.); Island Bay, Wellington, various brown algae, *Corallina*, 28/2/59 and 3/6/62 (W.F.P.); Lyall Bay, Wellington, Finlay Coll. (A.M.); Owhiro Bay, Wellington, *Corallina*, brown algae, 20/ 2/63 (W.F.P.); Titahi Bay, *Corallina*, brown algae, 5/6/62 (W.F.P.); Karehana Bay, Plimmerton, large brown algae, 7/12/61 (W.F.P.); Paremata Harbour, 1957 (W.F.P.); between Pukerua Bay and Paekakariki, brown algae, 24/12/61 (W.F.P.); Long Beach, Durville Island, rock pools, W. R. B. Oliver, 13/2/43 (D.M.); Tahunanui Beach, Nelson, shell sand (Powell Coll.); Cape Campbell, coralline algae, W. Ballantine, 16/2/64 (W.F.P.); Kaikoura, small algae, I. Mannering, -/8/63, *Corallina*, R. A. Rusmussen, 12/6/64, fine brown algae, P. Luckens, 12/8/64 (W.F.P.); Oaro, South of Kaikoura, *Corallina*, W. Ballantine, 19/2/64 (W.F.P.); Taylor's Mistake, tall coralline algae, -/9/63 (W.F.P.); Purau, Lyttelton Harbour, shell sand, 1/1/07 W. R. B. Oliver (D.M.); East of Purau, Lyttelton Harbour, fine brown algae, coralline algae, W. R. B. Oliver, 4/9/10 (D.M.); East of Diamond Harbour, Lyttelton Harbour, *Corallina*, under stones, -/9/63 (W.F.P.); Gollan's Bay, Lyttelton Harbour, brown algae, W. R. B. Oliver, 26/3/10 (D.M.); Okain's Bay, Bank's Peninsula, W. R. B. Oliver, 10/11/06 (D.M.); Oamaru, Finlay Coll. (A.M.); Bushy Beach, Oamaru, coralline algae, W. Ballantine, 24/2/64 (W.F.P.); Little Papanui, Dunedin, gelatinous red algae, coralline algae, 5/9/63 (W.F.P.); Ship's Channel side of Quarantine Island, Dunedin Habour, brown algae, *Corallina*, fine red algae, 4/9/63 (W.F.P.); Bluff, *Corallina*, M. Spong, 27/5/63 (W.F.P.); Ewing Island, Port Ross, Auckland Island, Cape Expedition, R. A. Falla (A.M.); Waitangi, Chatham Islands, rock pools, algae and rocks between tides, W. R. B. Oliver, 8/12/09 (D.M.); Tionori, Chatham Islands, Dell. Coll. (D.M.).

Distribution: The North and South Islands, Stewart Island, Auckland Islands and the Chatham Islands. Annulate shells and the 'large form' are restricted to the North East of the North Island.

Ecology: *E. (D.) olivacea* is found in the littoral zone and down to a few fathoms where it lives on algae. In the vicinity of Auckland, finely divided algae (e.g. *Corallina* and *Carpophyllum plumosum*) is the favoured habitat of the 'small form', while the 'large form' (see above) is found almost exclusively on brown algae on open coasts. The species is rare under stones and in crevices.

Eatoniella (Dardanula) dilatata (Powell). Plate 7, figs. 13-15.

1955 *Notosetia dilatata* Powell, D.S.I.R., Bull. 15, Cape Exped. Series, p. 86, p. 13, fig. 21.
1962 *Notosetia dilatata* Powell; Smith, Rec. Dom. Mus. 4 (5), p. 52, fig. 7.

This species can be distinguished by its solid, oblique D-shaped aperture, swollen body whorl, small size, semi-transparent shell and short spire. The umbilical chink is visible in juveniles, but in adults it is covered by the thickened inner lip. The outer lip is thickened above and below, the thin middle part being slightly reflected. The colour is yellowish-white, except for the base and aperture which are white.

There is some variation in the size, the convexity of the whorls and the strength of the inner lip.

A series of shells from Whangarei Heads closely resembles the southern *dilatata* but no specimens from intermediate localities have been seen.

Animal: (Stewart Island). The exposed parts are unpigmented. The mantle and visceral mass are brownish to black (dried material).

Operculum: (Fig. 14). Oval, rather thick, semi-transparent except muscle insertion area, with a strong grooved peg. Marginal areas yellow. Muscle insertion area rather extensive, dense yellowish white, broken on left end. There is faint spiral sculpture developed and growth lines are clearly visible. Nucleus rather large for genus.

Radula: (Fig. 15). Typical of subgenus. Central 2 + 1 + 2, lateral 2 + 1 + 2. There are a few very fine serrations along a weak dorsal ridge lateral to outside denticle. Inner marginal with three small cusps, outer largest. Outer marginal with about 6 serrations and a broad base.

Holotype: (Fig. 13). Snares Islands, 50 fathoms, (ex Finlay Coll.) (A.M.).

Height 1.05 mm. Width 0.78 mm.

Material Examined:

Holotype and paratypes; MacGregor's Bay, Whangarei Heads, shell sand (Hipkins Coll.); Lyall Bay, Wellington, Finlay Coll. (A.M.); Lyall Bay (D.M.); Foveaux Strait, 1951 (Smith Coll.); Butterfield's Beach, Stewart Island, shell sand, -/10/47 (D.M.); Aker's Point, Halfmoon Bay, Stewart Island, 22/2/63, shell sand, M. Spong (W.F.P.); Poutama Island, South Cape, Stewart Island, 30 fathoms, -/6/55 (Smith Coll.); off East end of Ulva Island, Stewart Island, in kelp holdfast, -/8/57 (Smith Coll.); B.S. 137, off Passage Point, Dusky Sound, 12-15 fathoms, M.V. "Alert", W. H. Dawbin, 8/1/52 (D.M.); 50 fathoms, Doubtful Sound (W.F.P.); 50 fathoms, Snares Islands, Finlay Coll. (A.M. and Powell Coll.); Waitangi, Chatham Islands, rocks between tides, W. R. B. Oliver, -/12/09 (D.M.); Waitangi, shell sand, -/1/33 (A.M.); Red Bluff, Chatham Islands, W. R. B. Oliver, 6/12/09 (D.M.).

Distribution: The East Coast of the North and South Islands, Fiordland, Stewart Island, and the Snares and Chatham Islands. In the northern part of its range, this species is very poorly known and rare.

Eatoniella (Dardanula) fossa n. sp. Plate 7, fig. 21.

Shell of medium size for subgenus, solid, smooth, shining, ovate-conic, a groove between inner-lip and body whorl. Spire rather tall, very slightly convex; whorls $4\frac{1}{2}$, faintly convex, smooth and polished; protoconch smooth, small; sutures distinctly false margined; body

whorl with a rounded periphery and base. Aperture small, rounded, slightly angled posteriorly, with a deep groove between inner lip and body whorl. Peristome continuous, thickened, especially in posterior corner; outer lip thickened internally, with a sharp edge, hardly excavated. Colour of dead shells varies from brownish-yellow to white, a band below the sutures may be darker or lighter than rest of shell; aperture and umbilical region white. A few irregular zig-zag markings sometimes developed on last part of body whorl from a peripherial dark band or small dark blotches. The dark subsutural band, if present, may break up into irregular blotches on the body whorl. Holotype yellowish-white with a few faint brown blotches on last part of body whorl and a large reddish-brown blotch just behind aperture.

This species is easily distinguished from all the other members of the genus by the channel between the aperture and the body whorl. Though this is similar to that seen in *Scrobs*, the resemblance is only superficial; other shell characters showing that this species is an eatoniellid.

Animal, operculum and radula unknown.

Holotype: (Fig. 21). 22 fathoms, ½ mile off West side of Stephenson's Island, 3½ miles from Whangaroa, 29/12/53 (ex Hipkins Coll.) (A.M.).

Height 1.9 mm. Width 1.2 mm.

Paratypes: Auckland and Dominion Museums, N.Z. Geological Survey, Lower Hutt, K. Hipkins Collection.

Material Examined: Holotype and paratypes.

Distribution: Off Whangaroa in moderately deep water.

Eatoniella (Dardanula) fuscosubucula n. sp. **Pl. 7, figs. 10-12.**

Shell small, broadly conical, with a large D-shaped aperture, white, but with a brown, inner chitinous layer showing through. Spire short, whorls 4, rapidly increasing, convex, sutures indistinctly false margined; body whorl large, swollen, periphery and base rounded. Aperture large, D-shaped; peristome thickened, continuous; inner lip concave, wide, expanded, columella nearly vertical, produced below. Outer lip thickened posteriorly and internally, sharp edged and strongly excavated. Colour of spire dark yellowish-brown due to chitinous layer showing through, the otherwise transparent-white. Aperture and lower part of base white.

Though similar to *E. (D.) dilatata* (Powell), *fuscosubucula* is easily distinguished by its colour and larger size. It differs from *E. (D.) verecunda* (Suter) in its smaller size, relatively larger aperture, thinner shell and the brown inner layer.

Animal: (Portobello). Unpigmented, and typical of the genus. (Preserved material).

Operculum: (Fig. 11). D-shaped, convex, marginal areas wide, transparent, yellowish, peg curved, solid, grooved. Muscle insertion area extensive, yellow. Very weak growth lines and spirals present.

Radula: (Fig. 12). Central rather small, 2 + 1 + 2; lateral 2 + 1 + 2, with dorsal and ventral thickenings. Inner marginal with one broad cusp

and a long basal process. Outer marginal finely serrate, with a broad base. The structure of the inner marginal tooth is unique in the family.

Holotype: (Fig. 10). Thule North, Paterson Inlet, Stewart Island, -/1/50 (ex Smith Coll.) (A.M.).

Height 1.4 mm. Width 0.95 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt, Smith Collection.

Material Examined:

Holotype and paratypes; Portobello, Dunedin Harbour, *Corallina,* under stones, soft red algae, 2/9/63 (W.F.P.); Ships' Channel side of Quarantine Island, Dunedin Harbour, *Corallina,* 4/9/63 (W.F.P.); Bathing Beach, Stewart Island, O. Allan 1950 (D.M.); off Jaques Lees Island, Stewart Island, 30 fathoms, O. Allan, -/4/51 (D.M.); off Pontama, South Cape, Stewart Island, 30 fathoms, in craypot, -/6/55 (Smith Coll.); Cape Expedition, Ewing Island, Port Ross, Auckland Islands, R. A. Falla (A.M. and D.M.).

Distribution: The South of the South Island, Stewart Island, and the Auckland Islands, from low tide to moderately deep water.

Eatoniella (Dardanula) latebricola n. sp. Plate 7, figs. 3-6.

Shell of moderate size for genus, smooth, solid, semi-transparent, yellowish-white, broadly-conical, spire about same height as aperture. Whorls 4, rapidly increasing, weakly convex; protoconch smooth, not marked off; sutures false margined; body whorl large, convex. Aperture large, D-shaped, solid; inner lip wide, thick, flanged below; outer lip thickened above, below and slightly in middle portion where it is strongly excavated. Imperforate, but a small slit between inner lip and body whorl due to growth of the former over the latter. Colour pale yellowish-white, aperture white.

Animal: (Fig. 4). Cephalic tentacles moderately long, slightly tapered, mildly active, colourless; eyes large, on swellings at outer base of tentacles, and beneath transparent shell edge. Snout short, bilobed, pale yellowish; buccal mass orange, yellow in juveniles. Foot long, rounded anteriorly and posteriorly, with a slit from middle of sole to posterior end, posterior mucous gland clearly visible ventrally as a dense white mass, rest of foot semi-transparent white. Opercular lobe white, a very short tentacle sometimes present on the left side. The anatomy is like that of *Eatoniella* (*Pellax*) *huttoni* and *E.* (*D.*) *olivacea* (Ponder—a). The stomach contains fragments of algal material similar to that of the *Durvillea* holdfast under which the animal lives.

Operculum: (Fig. 5). D-shaped, curved, columella marginal area wide, transparent, yellowish. Muscle insertion area extensive, pale brown near the columella edge, brownish yellow in central area, yellow near outer edge, white at outer edge. Peg heavy, grooved, curved.

Radula: (Fig. 6). Typical of the genus. Central 2 + 1 + 2, large. Lateral rather small, elongate, 2 + 1 + 2, with weak dorsal and ventral thickenings. Inner marginal with 6 small cusps, and a small cusp-like process on outer side, rather broad with a short basal process. Outer marginal finely serrate, with a broad base.

Holotype: (Fig. 3). South end of Muriwai, under *Durvillea* holdfasts, 19/8/63, W.F.P. (A.M.).

Height 1.65 mm. Width 1.05 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined: Holotype and paratypes; Piha under *Durvillea* holdfasts, 1962-64 (W.F.P.).

Distribution: The Auckland West Coast, underneath the holdfasts of the giant kelp, *Durvillea antarctica.*

Eatoniella (Dardanula) limbata (Hutton). **Plate 5, figs. 10, 11.**

1883 *Cingula limbata* Hutton, N.Z. Journ. Sci. I, p. 477.
1884 *Cingula limbata* Hutton; Hutton, Trans. N.Z. Inst. 16, p. 214.
1887 *Rissoa* (*Setia*) *limbata* (Hutton); Tyron, Man. Conch. 9, p. 355, pl. 71, fig. 98.
1898 *Phasianella limbata* (Hutton); Suter, Proc. Mal. Soc. 3, p. 8.
1905 *Rissoina* (*Eatoniella*) *limbata* (Hutton); Webster, Trans. N.Z. Inst., 37, p. 278, pl. 10, fig. 8, 8a.
1913 *Rissoina* (*Eatoniella*) *limbata* (Hutton); Suter Man. N.Z. Moll. p. 225, pl. 13, fig. 18.
1915 *Dardanula limbata* Hutton; Iredale, Trans. N.Z. Inst., 47, p. 454.

The large, solid shell of this species is rendered distinctive by white zig-zag markings on a light greyish-brown to black background. These markings are variably developed, sometimes extending over the whole whorl, or as in the type, restricted to a sutural and/or peripheral series. On shells from some localities the white markings are hardly present, only a few irregular streaks occurring at wide intervals. The whorls are flat to very lightly convex and the periphery is angled.

Animal: (Auckland Harbour). Cephalic tentacles tapering, long, actively motile, and colourless. Snout bilobed, short. Foot moderately long, with a well defined slit in posterior half of sole. Opercular lobe with a short tentacle on left side. Colour variable, usually with some black pigmentation, though this not as heavily developed as in *E. (D.) olivacea.* The body is usually grey, and sometimes with a green tinge. The buccal mass is orange and the opercular lobes black.

Operculum: Thickened, oval, with an extensive muscle insertion area, strongly curved. Marginal area narrow, bordered internally by a black line. A broad, strong internal ridge present. Colour yellowish to brownish with some black marginal patches internally, but externally with more black, the central area being yellowish to grey. Peg yellow, strong, curved, with a terminal flange. Sculpture of fine spiral lines and rather strong growth lines.

Radula: Typical of subgenus. Central 3 + 1 + 3, lateral 2 + 1 + 2, inner marginal with three small cusps, outer with about 12 serrations.

Lectotype: (Fig. 10). (Here designated) Auckland (Cant. Mus.).

Height 2.4 mm. (estim.). Width 1.5 mm.

Material Examined:

Lectotype and paralectotypes; between Cape Maria Island and mainland, 4 fathoms, -/2/61 (Hipkins Coll.); Spirits Bay, shell sand, (Hipkins Coll.); Taupo Bay, Whangaroa, E. R. Richardson, 11/4/51 (D.M.) and 12/1/54 (Hipkins Coll.);

Whangaroa, W. LaRoche, Finlay Coll. (A.M.); Tapeka Point, Russell, -/1/52 (Hipkins Coll.); Russell, Bay of Islands (Powell Coll.); Oneroa, Bay of Islands, under stones, -/11/62 (W.F.P.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.) and algae, under stones, 22/5/63 (W.F.P.); Taurikura Bay, Whangarei Heads, under stones, *Corallina*, -/5/63 (W.F.P.); Smuggler's Bay, Whangarei Heads, under stones, -/5/63 (W.F.P.); Poor Knights Islands, under stones in pools, 4/4/64 (W.F.P.); Bream Tail, under stones, 12/8/63 (W.F.P.); Goat Island Bay, Leigh, under stones, *Carpophyllum* spp., 1962-64 (W.F.P.); Tryphena Bay, Great Barrier Island, 6 fathoms, A. W. B. Powell, 18/1/25 (D.M. and Powell Coll.); Tryphena Bay, Great Barrier Island, -/1/51 (Hipkins Coll.); Tawharanui Point, North and South sides, under stones, 31/12/63 (W.F.P.); Waiwera, *Carpophyllum* spp., under stones, 16/2/64 (W.F.P.); Brown's Bay, Auckland, brown algae, 19/1/64 (W.F.P.); off Otata Island, Noises Group, West side, 4 fathoms, coarse shell sand, 15/5/63 (W.F.P.); off Takapuna, Auckland, 4-6 fathoms, Laws Coll. (A.M.); Takapuna, under stones, *Corallina*, brown algae, 1962-64 (W.F.P.); Narrow Neck, Auckland, brown algae, under stones, 1962-64 (W.F.P.); St. Heliers, Auckland, Finlay Coll. (A.M.); Stanley Point, Auckland Harbour, *Sargassum* (W.F.P.); off Wairoa Pt., Waiuku Channel, Manukau Harbour, 4 fathoms, S. Hulme (W.F.P.); Cornwallis, Manukau Harbour, *Corallina* and under stones, 7/1/62 (W.F.P.); Jackson's Bay, Coromandel, under stones, fine red algae, 30/3/64 (W.F.P.); Bowentown, Tauranga Harbour, under stones, -/5/63 (W.F.P.); Omokoroa, Tauranga Harbour, 31/8/58 (W.F.P.); Mount Maunganui, Tauranga, Finlay Coll. (A.M.); Tolaga Bay, shell sand, R. K. Dell, 28/11/50 (D.M.); Lyall Bay, Wellington, shell sand, 17/2/56 (W.F.P.); Island Bay, Wellington, *Cystophora* (W.F.P.); Titahi Bay, 1905 (D.M.); Titahi Bay, *Corallina*, 5/6/62, and shell sand, -/11/55 (W.F.P.); Paremata Harbour, 1957 (W.F.P.); Pukerua Bay, on algae holdfasts washed ashore, 18/6/60 (W.F.P.); between Pukerua Bay and Paekakariki, under stones, 30/10/57 (W.F.P.); Middle Bank, Kapiti Island, in moki stomach contents, 14/1/62 (W.F.P.); B.S. 129, Pelorus Sound, 25-30 fathoms, M.V. "Alert", W. H. Dawbin, 26/12/51 (D.M.); Manaroa Bay, Pelorus Sound, mussel scrapings, 28/12/58 (W.F.P.); Bluegum Point, Kenepuru Sound, under stones, -/1/58 (W.F.P.); Nelson Harbour (Powell Coll.); Tahunanui Beach, Nelson, shell sand (Powell Coll.); Taylor's Mistake, Bank's Peninsula, soft coralline algae, W. R. B. Oliver, 10/4/10 (D.M.); Lyttelton Harbour, shell sand, 14/12/56 (W.F.P.); East of Diamond Harbour, under stones, -/9/63 (W.F.P.); Foveaux Strait, oyster beds (W.F.P.); off Mouth of Halfmoon Bay, Stewart Island, 8 fathoms, clean algae, -/4/59 (Smith Coll.); 4 fathoms, Paterson Inlet, Stewart Island, algae, -/8/58 (Smith Coll.); 18 fathoms off Bravo Island, Paterson Inlet, in lump of worm tubes, 22/7/54 (Smith Coll.); Port Pegasus, Stewart Island, 5 fathoms, M.V. "Alert", W. H. Dawbin (D.M.); B.S. 104, Chalky Inlet, 20 fathoms, M.V. "Alert", W. H. Dawbin, 6/5/50 (D.M.); B.S. 137, off Passage Point, Dusky Sound, 12-15 fathoms, M.V. "Alert", W. H. Dawbin, 8/1/52 (D.M.); B.S. 106, between Unnamed Island and Breaksea Sound, Dusky Sound, 20 fathoms, M.V. "Alert", W. H. Dawbin, 7/5/50 (D.M.); Doubtful Sound, 50 fathoms (W.F.P.); B.S. 107, Goal Passage, Doubtful Sound, 25 fathoms, M.V. "Alert", W. H. Dawbin, 2/5/50 (D.M.); B.S. 109, Bligh Sound, 25 fathoms, M.V. "Alert", W. H. Dawbin, 10/5/50 (D.M.); Chatham Islands (D.M.); Chatham Islands Exped., Stat. 13, Owenga, 4-6 fathoms, M.V. "Alert", 27/1/54 (D.M.); Chatham Island Exped., Stat. 38, South of Little Mangere, 43 fathoms, M.V. "Alert", 2/2/58 (D.M.).

Distribution: The North and South Islands, Stewart Island and the Chatham Islands, from near low water to a few fathoms.

Ecology: *E. (D.) limbata* occupies a wide range of habitats, from silted harbours to exposed coasts. In the former habitat, as seen in Auckland Harbour, it is often the dominant micro-mollusc, living on brown algae, in *Corallina* and under stones. In more exposed situations it is usually restricted to living under stones, though the choice of substratum is rather variable according to the locality and the abundance of competing species. If other *Eatoniella* species are absent or rare, *E. (D.) limbata* occupies many substrata and is generally common, but if the area is suitable for other eatoniellids and rissoids, it is usually

uncommon or absent on all substrata except under clean stones, where it is frequently very abundant.

Eatoniella (Dardanula) minutocrassa n. sp. Plate 6, figs. 13-15.

Shell minute, rather thin shelled but with a thickened aperture, colour usually pinkish, smooth and shining. Spire short, about 3½ whorls. Whorls moderately convex, smooth. Protoconch not marked off, smooth. Colour purplish-pink in holotype, but variable, purplish to pink, yellowish-brown to grey. Sutures false-margined with a dark purplish band. Columella and umbilical area of base darker in colour. Aperture oval, angled above, columella produced below slightly and thickened. Peristome rather thick and heavy, except the thin middle part of outer lip, which is strongly retracted. A small depression indicates border of umbilical chink which is hidden by inner lip. A narrow, colourless, transparent zone behind outer lip.

This species is readily distinguished from any other by its minute size, convex whorls, solid aperture and pinkish coloration.

Animal: (Island Bay, Wellington). Anterior lobe of foot long and mobile, sole with a mucous slit extending from centre of foot to posterior end. Tentacles very active, tapering. Snout short, bilobed. Colour yellowish. No opercular tentacles. Eyes remain beneath transparent edge of shell.

Operculum: (Fig. 14). (Leigh). Oval, curved, solid, yellow, semi-transparent. Muscle impression area extensive, yellowish-white, opaque. Peg short, broad, with a terminal flange. Marginal areas rather broad. Growth lines indistinct and a few faint spirals visible.

Radula: (Fig. 15). Typical of the subgenus. Central rather large, 2 + 1 + 2, lateral 2 + 1 + 2, with dorsal and ventral thickenings. Inner marginal with 3 cusps, outer marginal finely serrate, with a broad base. W.F.P. (A.M.).

Holotype: (Fig. 13). Goat Island Bay, Leigh, in *Corallina*, 1/1/64, W.F.P. (A.M.).

Height 0.925 mm. Width 0.6 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; Great Island, Three Kings Islands, sublittoral algae, A. Baker (W.F.P.); N.Z.O.I. Stat., C. 760, 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, 18/2/62 (O.I.); Spirits Bay, shell sand (Hipkins Coll.); 22 fathoms, ½ mile West of Stephenson's Island, 3½ miles off Whangaroa, 29/12/53 (Hipkins Coll.); Taupo Bay, Whangaroa, shell sand, E. R. Richardson, 11/4/51 (D.M.) and 2/1/54 (Hipkins Coll.); Tapeka Point, Russell, -/1/52 (Hipkins Coll.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.) and algae, 22/5/63 (W.F.P.); Smuggler's Bay, Whangarei Heads, short red algae, brown algae, coralline algae, 5/5/62 (W.F.P.); Taurikura Bay, Whangarei Heads, under stones, 15/5/61 (W.F.P.); Lort Point, Whangarei Heads, *Corallina*, -/5/62 (W.F.P.); Poor Knights Islands, under stones and vermetid masses, coralline algae, brown algae, 4/4/64 (W.F.P.); Goat Island Bay, Leigh, brown algae, *Corallina*, under stones, 1963-64 (W.F.P.); Tawharanui Point, North and South side, under stones, 31/12/63 (W.F.P.); Takapuna, Auckland, *Corallina* 1962-64 (W.F.P.); Campbells Bay, Auckland, *Caulerpa*, W. Ballantine (W.F.P.); Cornwallis, Manukau Harbour, silted *Corallina*, 7/1/62 (W.F.P.); 1 mile West

of Cornwallis, clean *Corallina*, 7/1/62 (W.F.P.); off Mayor Island, fish stomach contents, G. Williams (Powell Coll.); Tolaga Bay, R. K. Dell, 28/11/50 (D.M.); Island Bay, Wellington, algae, (D.M.) and algae, *Corallina*, 3/6/62, and shell sand, 2/10/56 (W.F.P.); Titahi Bay, shell sand, -/11/55 (W.F.P.); Titahi Bay, among paratypes of *E.* (*D.*) *roseocincta* (Suter) (D.M. and G.S.); East of Diamond Harbour, Lyttelton Harbour, under stones, -/9/63 (W.F.P.); Gollan's Bay, Lyttelton Harbour, brown algae, W. R. B. Oliver, 26/3/10 (D.M.); Chatham Island Exped., Port Hutt, Chatham Islands, shell sand, 8/2/54 (D.M.).

Distribution: The North Island, North East of the South Island, and the Chatham Islands, from the lower littoral zone to moderately deep water.

Ecology: Though *E.* (*D.*) *minutocrassus* prefers coralline and other short turf algae at low tide, it is also found under stones and on larger algae such as *Carpophyllum plumosum*. Though it is usually uncommon, it has been recorded as a dominant species in a few localities, notably the Poor Knights Islands.

Eatoniella (Dardanula) mortoni n. sp. Plate 7, figs. 16-20.

Shell solid, of medium size for the subgenus, conical, smooth. Spire usually rather short, a little taller than height of aperture in the holotype, but there is considerable variation. Whorls 4, lightly convex, fairly rapidly increasing; protoconch smooth, small, not marked off, body whorl large, but not swollen, periphery and base rounded. Aperture moderately large, approximately D-shaped in typical shells, but distinctly D-shaped in squat specimens (fig. 18), the anterior angulation typically indefinite; peristome continuous, thickened, inner lip broad, posterior part of outer lip especially heavy. Outer lip excavated strongly below. Colour variable, from dark grey, often with a purplish tint, to pale yellowish grey. Variation in shape is considerable, squat shells resembling *E.* (*D.*) *dilatata* (Powell), *E.* (*D.*) *latebricola* n. sp. and *E.* (*D.*) *fuscosubucula* n. sp. but can be separated on details of shape, colour and size. Tall shells resemble *E.* (*D.*) *olivacea*, but the new species can be distinguished by its rounded body whorl and apertural characters. Variation in the shell and the animal (see below) suggest that there may be more than one species included under this name.

Animal: (Leigh). Cephalic tentacles long, active, gradually tapering; eyes on outer bases of tentacles. Snout short, bilobed; buccal mass yellow to orange. Foot long, anterior mucous gland diffuse, posterior mucous gland large, dense white, opening into a slit extending from centre of sole to posterior end. Colour yellowish-white. Opercular lobe with no tentacle or group of mucous cells. (Island Bay) a short tentacle on left opercular lobe, and some black pigmentation on head and opercular lobes.

Operculum: (MacGregor's Bay). (Fig. 19). Oval, thick, strongly curved, peg broad, grooved. Muscle insertion area extensive, nearly opaque, pale brown on columella side, fading to yellowish near outer edge. Columella marginal area broad, yellowish transparent, outer marginal area similar but narrow. No internal ridge or thickening. Weak growth lines and fine spirals present.

Radula: (Fig., 20). Typical of the genus. Central large, 3 + 1 + 3, lateral with heavy basal processes, 2 + 1 + 2, inner marginal with 5 denticles and a cusp-like process on outer side just below the cutting edge. Outer marginal narrow, with a broad base and finely serrate.

Holotype: (Fig. 16). South side of Day's Bay, Wellington Harbour, on brown algae, 11/12/61 (W.F.P.) (A.M.).

Height 1.85 mm. Width 1.13 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, and the N.Z. Geological Survey, Lower Hutt.

Material Examined:

Holotype and paratypes; Spirits Bay, shell sand (Hipkins Coll.); Taupo Bay, Whangaroa, shell sand, 2/1/54 (Hipkins Coll.); Tapeka Point, Russell, shell sand, -/1/55 (Hipkins Coll.); Poor Knights Islands, brown algae, 4/4/64 (W.F.P.); MacGregor's Bay, Whangarei Heads, algae, 22/5/63 (W.F.P.); Smuggler's Bay, Whangarei Heads, coralline algae, 6/5/62 (W.F.P.); Kaitoke, Great Barrier Island, short algae, 16/9/63 (W.F.P.); Jackson's Bay, Coromandel, *Carpophyllum plumosum*, 29/3/64 (W.F.P.); Stony Bay, Coromandel, *Corallina* and other short algae, 28/3/64 (W.F.P.); Lyall Bay, Wellington *Cystophora dumosa*, W. R. B. Oliver, 18/12/21 (D.M.); Island Bay, Wellington, algae, 3/6/62 (W.F.P.); Scorching Bay, Wellington, brown algae, 26/11/61 (W.F.P.); Owhiro Bay, Wellington, brown algae, 20/2/63 (W.F.P.); Taylor's Mistake, coralline algae, -/8/63 (W.F.P.) and W. R. B. Oliver, 10/4/10 (D.M.); East of Diamond Harbour, Lyttelton Harbour, -/8/63 (W.F.P.); Taieri Beach, Otago, Finlay Coll. (A.M.); Red Bluff, Chatham Islands, W. R. B. Oliver, 6/12/09 (D.M.); Tioriori, Chatham Islands, Dell Coll. (D.M.); Waitangi, Chatham Islands, pools between tides, W. R. B. Oliver, -/12/09 (D.M.).

Distribution: The East Coasts of the North and South Islands and the Chatham Islands, on algae at low tide.

I have much pleasure in naming this mollusc after Professor J. E. Morton, for his assistance during the course of this work.

Eatoniella (Dardanula) obtusispira (Powell). Plate 7, figs. 7-9.

1955 *Dardanula obtusispira* Powell; D.S.I.R. Bull. 15, Cape Exped. Series, p. 88, pl. 3, fig. 23.

1962 *Notosetia verecunda* Smith (not of Suter) (in part) Rec. Dom. Mus. 4 (5), p. 60, fig. 24.

This distinctive species is easily recognised by the solid, white shell, with a tall spire and blunt apex. The whorls are slightly convex, and the protoconch large and blunt. A small false umbilical chink is present. There is considerable variation in size (c.f. figs. 7 and 8) but the shape seems to remain fairly constant.

Animal: (Stewart Island). No pigmentation on exposed parts. (Dried specimen).

Operculum: (Fig. 9). Oval, yellowish, with an extensive, opaque muscle insertion area, though broken near the nucleus. Peg strong and grooved. Marginal area narrow. No internal ridge.

Radula: Unknown.

Holotype: (Fig. 7). Snares Islands, 50 fathoms (ex Finlay Coll.) (A.M.).

Height 2.2 mm. Width 1.4 mm.

Material Examined:

Holotypes and paratypes; 72 fathoms off Cape Saunders, Otago, Laws Coll. (A.M.); 50 fathoms, 10 miles E.N.E. Otago Heads, Finlay Coll. (A.M.); Bluff, Finlay Coll. (A.M.); Oyster bed, near Fairchild River, Foveaux Strait, 28/9/55 (Smith Coll.); Bathing Beach, Stewart Island (D.M.); off Mouth of Halfmoon Bay, 8 fathoms, clean sand, -/3/59 (Smith Coll.); off Poutama Island, South Cape,

Stewart Island, 30 fathoms, -/6/55 (Smith Coll.); 100 fathoms off Puyseger Point, South West Otago (D.M.); B.S. 104, Chalky Inlet, 20 fathoms, M.V. "Alert", W. H. Dawbin, 6/5/50 (D.M.); B.S. 110, entrance to George Sound, 15-20 fathoms, M.V. "Alert", W. H. Dawbin, 10/5/50 (D.M.).

Distribution: The South of the South Island, Stewart Island and the Snares Islands, in shallow to deep water.

Eatoniella (Dardanula) roseocincta (Suter). Plate 6, figs. 9-11.

1908 *Rissoa roseocincta* Suter, Proc. Mal. Soc. Lond. 8, p. 29, pl. 12, fig. 26.
1913 *Rissoa (Cingula) roseocincta* Suter; Suter, Man. N.Z. Moll. p. 209, pl. 12, fig. 17.
1915 *Estea roseocincta* Suter; Iredale, Trans. N.Z. Inst. 47, p. 454.
1927 *Dardanula roseocincta* Suter; Finlay, Trans. N.Z. Inst. 57, p. 378.
1959 *Dardanula roseocincta* Suter; Boreham, N.Z. Geol. Surv. Pal. Bull. 30, p. 37.

E. (D.) roseocincta exists in two forms. The typical form, which is found throughout the North Island, is a small, thin shell with weakly convex whorls. The body whorl is a little swollen and the aperture has a distinct inner lip which is slightly separated from the body whorl by a groove and a prominent umbilical chink which opens into a very minute umbilicus. The outer lip is thickened above and strongly excavated. The colour pattern is distinctive as there is a bright pink band above and below the sutures, the former continuing as a broad band around the periphery to the outer lip. Another pink area surrounds the umbilicus and the rest of the shell is very pale pink or white. The second form which is found in the far North and North East of the North Island, has a more solid shell which is uniform rose and has a heavier aperture. The umbilical chink is absent or very small, but a groove still separates the inner lip from the body whorl. This form is usually called *Dardanula roseola* in collections, but it differs from that species in being much smaller. The animal of this latter form is unknown and it may prove to be distinct. They are not subspecies, as both forms occur together in some localities.

Animal: (Three Kings, sublittoral algae). Unpigmented except for tracts of black on back of head and mantle roof. (Preserved material).

Operculum: Oval, thick, yellow, slightly curved, peg strong grooved; muscle insertion area extensive. A very indistinct thickening, corresponding to the internal ridge of some species, present. Marginal areas narrow.

Radula: Radula sac long, coiled. Typical of genus. Central large, cusps 3 + 1 + 3. Lateral, cusps large 2 + 1 + 2, thickened ridges above and below. Inner marginal with 3 cusps, outer finely serrate, with a broad base.

Lectotype: Titahi Bay, Cook Strait, Coll. M. Mestayer (G.S.).

Paralectotype: (Fig. 9). Height 1.35 mm. Width 0.775 mm.

Material Examined:

Paralectotypes; Three Kings, sublittoral algae, A. Baker (W.F.P.) (typical form); Spirits Bay, shell sand (Hipkins Coll.) (typical and atypical); Cape Maria van Diemen, shell sand (W.F.P.) (atypical); Doubtless Bay, 12 fathoms, Finlay Coll. (A.M.) (typical and atypical); Awanui Bay, 12 fathoms (Powell Coll.) (atypical); Taupo Bay, Whangaroa, shell sand, E. R. Richardson (D.M.) (atypical); Poor Knights Islands, 4/4/64 (W.F.P.) (atypical); Smuggler's Bay, Whangarei Heads, shell sand, 6/5/62 (W.F.P.) (typical); Mokohinau Islands (W.F.P.) (atypical); Lyall Bay, Wellington, Finlay Coll. (A.M.) (typical); Island Bay, Wellington, shell sand, 2/10/56 (W.F.P.) (typical); Titahi Bay, shell

sand, -/11/55 and 5/6/62 (W.F.P.) (typical); off Middle Bank Kapiti Island, in moki stomach contents, 14/1/62 (W.F.P.) (typical).

Distribution: The North Island, East and West Coasts, probably restricted to sublittoral algae.

Eatoniella (Dardanula) roseola (Iredale). Plate 6, figs. 1-8.

1873 *Rissoa rosea* Hutton, Cat. Mar. Moll., p. 29.
1880. *Barleeia rosea* (Hutton); Hutton Man. N.Z. Moll. p. 81.
1887 *Barleeia rosea* (Hutton); Tryon, Man. Conch. (1), 9, p. 393, pl. 71, fig. 6.
1898 *Barleeia rosea* (Hutton); Suter, Proc. Mal. Soc., 3, p. 8.
1909 *Rissoa (Cingula) rosea* Hutton; Suter, Subant. Is. N.Z., 1, p. 17.
1913 *Rissoa (Cingula) rosea,* Hutton; Suter, Man. N.Z. Moll., p. 209, pl. 12, fig. 16.
1915 *Estea roseola* Iredale, nom. nov. for *R. rosea* Hutton non Deshayes, 1862, Trans. N.Z. Inst., 47, p. 453.
1924 *Rissoa roseola* Iredale; Odhner, N.Z. Moll. Pap., Mortensen Pacific Exped., p. 21.
1927 *Dardanula roseola* Iredale; Finlay, Trans. N.Z. Inst., 57, p. 378.
1955 *Dardanula roseola* Iredale; Powell, D.S.I.R., Cape Exped. Series Bull. 15, p. 88.
1955 *Dardanula roseola lacteola* Powell, D.S.I.R., Cape Exped. Series Bull. 15, p. 88, pl. 3, fig. 25.

Though the holotype of *E. (D.) roseola* is a very badly broken shell, the distinctive colour and shape are unmistakable. The species is of intermediate size for the sub-genus, with a solid shell, having a tall spire, straight outlines, nearly flat whorls, an angled periphery, and a sharp apex. The peristome is moderately thickened and the outer lip only slightly retracted. The colour is typically bright pink, but the shell may be white or banded with pink.

Considerable variation exists within, and between, populations. Typical shells (figs. 2, 5) are solid, relatively large and of a uniform bright pink colour. Northern shells are usually somewhat smaller, with more convex whorls and frequently develop distinct bands of pink, the rest of the shell, including the base, being white (fig. 6). Fiordland specimens show considerable variation (figs. 1, 1a, 1b), samples from Bligh Sound being particularly variable—small squat shells with convex whorls and large normal-looking shells occur together, and these may, or may not, develop colour bands. A population of small, very pale pink shells with a pink band below the periphery of the body whorl, occurs off Puysegur Point, South West Otago. The base is rounded, the whorls convex and the sutures margined.

Powell's "subspecies", *lacteola,* is a large, white variant of *roseola.* The holotype of *lacteola* is a large shell for the species (height 2.265 mm.) but most of the paratypes are of normal size. Large shells are also found in other localities, fig. 3 being a large, pale pink shell from Bluff. Pink shells also occur at the Auckland Islands (fig. 2), the type locality for *lacteola.* White shells are found in samples taken throughout most of New Zealand, though these are generally from deepwater.

Animal: (Whangarei Heads). (Fig. 7). Cephalic tentacles tapering, active, smooth; snout bilobed, short. Foot long, slightly rounded anteriorly, rounded posteriorly, a mucous slit from centre of sole to posterior end. A single opercular tentacle on left side. Colour uniform pale yellowish-white.

Operculum: (Paterson Inlet, Stewart Island). (Fig. 8). Oval, nearly flat, yellow, with a weak internal ridge, faint spiral sculpture and weak

growth lines. Marginal area narrow. Muscle impression area indistinct but extensive, semi-transparent, not broken except near nucleus. Peg strong, grooved.

Radula: Similar to *E.* (*D.*) *olivacea* (Hutton). Central 2 + 1 + 2, lateral 2 + 1 + 2, inner marginal with 3 cusps, outer finely serrate.

Holotype: Stewart Island (D.M.) (broken). The dimensions of a specimen from Stewart Island (fig. 5) are given as typical dimensions for the species.

Height 1.93 mm. Width 1.14 mm.

Material Examined:

Holotype; N.Z.O.I., Stat. C. 760, 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, bryozoan substrate, 18/2/62 (O.I.); 8 fathoms between Cape Maria van Diemen and mainland, -/2/61 (Hipkins Coll.); Spirits Bay, shell sand (Hipkins Coll.); Cape Maria van Diemen, shell sand (W.F.P.); Taupo Bay, Whangaroa, shell sand (Hipkins Coll.); 22 fathoms, ½ mile West of Stephenson's Island, off Whangaroa, 29/12/53 (Hipkins Coll.), Tapeka Point, Russell, shell sand, -/1/52 (Hipkins Coll.); 60 fathoms off Poor Knights Islands, Finlay Coll. (A.M.); Smuggler's Bay, Whangarei Heads, shell sand, 6/5/62 (W.F.P.); Taurikura Bay, Whangarei Heads, main channel in *Glycymeris* community, 7/5/63 (W.F.P.); Tryphena Bay, Great Barrier Island, shell sand, -/1/51 (Hipkins Coll.); off Emu Rock, Motuihe Channel, Hauraki Gulf, 8 fathoms, *Tawera* community (W.F.P.); off Mayor Island, in fish stomach contents, G. Williams (Powell Coll.); B.S. 173, Kapiti Channel, Cook Strait, 40° 52.2' S., 174° 57.2' E., 33 fathoms, M.V. "Alert", 30/8/51 (D.M.); Timaru, W. R. B. Oliver, -/2/07 (D.M.); Portobello, Dunedin Harbour, soft red algae, 3/9/63 (W.F.P.); 50 fathoms, 10 miles E.N.E. of Otago Heads (Powell Coll.); 60 fathoms, Otago Heads, Finlay Coll. (A.M.); 40-50 fathoms, Cape Saunders, Otago, Laws Coll. (A.M.); B.S. 190, 45° 45.4' S., 171° 5' E., off East Otago Coast, Canyon "B", 800 fathoms, M.V. "Alert", 16/8/55 (D.M.); Bluff, Finlay Coll. (A.M.); Oyster scrapings, Foveaux Strait, M. Spong (W.F.P.) and 1957 (W.F.P.); off Cape Island, South Cape, Stewart Island, 40-45 fathoms, in bryozoans and algae, -/1/55 (Smith Coll.); Glory Inlet, Stewart Island, 10-20 fathoms, -/1/57 (Smith Coll.); off Poutama Island, South Cape, Stewart Island, 30 fathoms, -/6/55 (Smith Coll.); Port Pegasus, Stewart Island, 18 fathoms (A.M.); off mouth of Halfmoon Bay, -/4/49, 8 fathoms, clean algae (Smith Coll.); Mason's Bay, Stewart Island, shell sand, O. Allan, -/8/48 (D.M.) and R. H. Harrison (A.M.); Bravo fishing ground, Patterson Inlet, Stewart Island, R. H. Traill, -/4/58 (Smith Coll.); Patterson Inlet, 8-10 fathoms, 19/4/54 (Smith Coll.); 100 fathoms, Puysegur Point, South West Otago (D.M.); B.S. 104, Chalky Inlet, 20 fathoms, M.V. "Alert", 6/5/50 (D.M.); Dusky Sound, 30 fathoms, R. Henry (D.M.); B.S. 106, between Breaksea and Unnamed Island, Dusky Sound, 20 fathoms, M.V. "Alert", W. H. Dawbin, 7/5/50 (D.M.); B.S. 137 off Passage Point, Dusky Sound, 12-15 fathoms, M.V. "Alert", W. H. Dawbin (D.M.); 50 fathoms, Doubtful Sound (W.F.P.); B.S. 107, Goal Passage, Doubtful Sound, 25 fathoms, M.V. "Alert", W. H. Dawbin, 8/5/50 (D.M.); Snares Islands, 50 fathoms (Powell Coll.); Auckland Islands, Finlay Coll. (A.M.); 6 fathoms, Carnley Harbour, Auckland Islands, Cape Expedition (Powell Coll.); Carnley Harbour, Auckland Islands, Cape Exped. (A.M.) and J. Sorensen, -/4/47 (D.M.); Faith Harbour, Auckland Island, beach drift (A.M.); 6 fathoms, Emergency Bay, C. A. Fleming, Cape Expedition (A.M.); Penguin Harbour, Campbell Island, 4 fathoms, R. L. Oliver, 5/8/44 (D.M.); Campbell Island, J. Sorensen (Powell Coll.); off Leeward Island, Antipodes, 15 fathoms, R. K. Dell, -/11/50 (D.M.); off East Cape, Antipodes Islands, 20 fathoms, R. K. Dell, -/11/50 (D.M.); 40-45 fathoms, and 50 fathoms, Bounty Islands (D.M.); 50 fathoms, Bounty Islands, Finlay Coll. (A.M.) and A. Hamilton (Powell Coll.); 170 fathoms, Bounty Islands, A. Hamilton Coll. (Powell Coll.); Mernoo Bank, 43° 21.5', 175° E., 52 fathoms (D.M.); Chatham Islands Exped. Stat. 38, South of Little Mangere, 43 fathoms, M.V. "Alert", 2/2/54 (D.M.); Chatham Island Exped. Stat. 23, 43° 32.5' S., 176° 47.5' W., North of the Sisters in 33 fathoms, M.V. "Alert", 29/1/54 (D.M.).

Distribution: The North and South Islands, Stewart Island, and the

Snares, Auckland, Campbell, Antipodes, Bounty and Chatham Islands, from low tide to moderately deep water, typically in a few fathoms, and most abundant in the South and Subantarctic.

Eatoniella (Dardanula) roseospira (Powell). Plate 6, fig. 12.

1936 *Dardanula roseospira* Powell, Discov. Rep. 15, p. 203, pl. 53, fig. 13.

This species appears to be typical of the *Dardanula* group in shell characters, but, as yet, the animal is unknown. A description is given below to facilitate identification.

Shell small, smooth, shining, elongate-conic. Whorls 4 to 4½, slightly convex, false margined with fine growth lines and spiral scratches; protoconch smooth, dome-shaped, not clearly marked off; periphery narrowly rounded. Aperture oval, with a slight posterior angulation; peristome thickened but not heavy; inner lip evenly concave, separated from body whorl below forming a chink which sometimes opens into a narrow umbilicus. Outer lip a little flanged and bent downwards posteriorly, slightly excavated below. Colour yellowish-brown or very pale pink, the first two whorls bright pink. Sometimes an indistinct white band in middle of body whorl. There is some variation in size and slight variation in colour.

Animal, operculum and radula unknown.

Holotype: Discovery Stat. 934, off Three Kings Islands, 92 metres (Brit. Mus.).

Height 1.4 mm. Width 0.95 mm. (from Powell)

Material Examined:

Paratypes (A.M.); N.Z.O.I. Stat. C. 760, 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, bryozoan substrate, 18/2/62 (O.I.); 4 fathoms, between Cape Maria van Diemen and mainland, -/2/61 (Hipkins Coll.); Taupo Bay, shell sand, E. R. Richardson, 11/4/51 (D.M.); Tapeka Point, Russell, -/1/52 (Hipkins Coll.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.).

Distribution: The far North and North East of the North Island, North of Whangarei.

Eatoniella (Dardanula) smithi n. sp. Plate 5, figs. 8, 9.

The shell is similar to that of *E.* (*D.*) *olivacea* (Hutton), but is usually taller, umbilicate, and of paler coloration. The aperture is round, with a rather thinner peristome than in *E.* (*D.*) *olivacea*. Whorls 5, nearly flat, sutures false margined with a white band. Colour varies from uniform dark purplish-grey to pure white. A thin dark band round edge of peristome, especially on outer lip, often developed. Except in darkly coloured specimens the shell colour is imparted by the yellowish-brown inner chitinous layer of the shell.

Animal: (Halfmoon Bay). The colour of the exposed parts is yellowish white, there being no trace of pigmentation as in *E.* (*D.*) *olivacea* (preserved material).

Operculum: (Fig. 9). Similar to that of *E.* (*D.*) *olivacea*. Oval, thick, curved, brownish, an irregular black patch on right and left ends, nucleus black. Peg flattened, grooved. Weak growth lines and fine spiral lines present. Muscle insertion area extensive. Marginal areas moderately wide, a very weak thickening in usual position for internal ridge.

Radula: Identical to that of *E. (D.) olivacea.*

Holotype: (Fig. 8). Halfmoon Bay, Stewart Island, -/9/47 (ex Smith Coll.) (A.M.).

Height 2.2 mm. Width 1.3 mm.

Paratypes: Auckland, Dominion and Canterbury Museums, N.Z. Geological Survey, Lower Hutt, E. Smith Coll.

Material Examined:

Holotype and paratypes; Foveaux Strait, oyster scrapings (W.F.P.); Bathing Beach, Stewart Island, O. Allan, 1950 (D.M.); off mouth of Halfmoon Bay, Stewart Island, 8 fathoms, clean algae, -/4/59 (Smith Coll.); 4 fathoms, Patterson Inlet, Stewart Island, algae, -/8/58 (Smith Coll.); Patterson Inlet, Stewart Island, 8-10 fathoms, 19/4/54 (Smith Coll.); Port Pegasus, Stewart Island, M.V. "Alert", 23/11/47 (D.M.); Bravo Group, Patterson Inlet, low tide on algae, 1/7/51 (Smith Coll.); 30 fathoms off Poutama Island, South Cape, Stewart Island, -/6/55 (Smith Coll.); B.S. 104, Chalky Inlet, 20 fathoms, M.V. "Alert", W. H. Dawbin, 5/5/50 (D. M.); B.S. 137, Passage Point, Dusky Sound, 12-15 fathoms, M.V. "Alert", W. H. Dawbin, 8/1/52 (D.M.); B.S. 106, between Unnamed Island and Breaksea, Dusky Sound, 20 fathoms, M.V. "Alert", W. H. Dawbin, 7/5/51 (D.M.); Doubtful Sound, 50 fathoms (W.F.P.); B.S. 110, inside entrance to George Sound, 15-20 fathoms, M.V. "Alert", W. H. Dawbin, 10/5/50 (D.M.); B.S. 109, Bligh Sound, 25 fathoms, M.V. "Alert", W. H. Dawbin, 10/5/50 (D.M.); Chatham Island Exped. Stat. 38, South of Little Mangere, 43 fathoms, 2/2/58, M.V. "Alert", (D.M.); Chatham Island Exped. Stat. 32, Waitangi, Chatham Islands, 7 fathoms, M.V. "Alert", 31/1/51 (D.M.); Chatham Islands Exped. Stat. 13, off Owenga, 4-6 fathoms, M.V. "Alert", 27/1/54 (D.M.).

Distribution: Foveaux Strait, Stewart Island, Fiordland, and the Chatham Islands, from low tide, on algae, to moderately deep water.

This species appears to replace *E. (D.) olivacea* at Stewart Island and can extend into deep water, a habitat not exploited by *E. (D.) olivacea.* At the Chatham Islands *E. (D.) smithi* appears to occur only in the sublittoral (dead shells only seen), while *E. (D.) olivacea* is the common littoral form.

Named in honour of Mrs E. Smith who has greatly advanced the study of the molluscan fauna of Stewart Island. Without her collection of Stewart Island eatoniellids at hand, much of this work would have been impossible.

Eatoniella (Dardanula) verecunda (Suter). Plate 7, figs. 1, 2.

1908 *Rissoa verecunda* Suter, Proc. Mal. Soc. London 8, p. 30, pl. 2, fig. 28.
1913 *Rissoa (Setia) verecunda* Suter; Suter, Man. N.Z. Moll., p. 216, pl. 13, fig. 4.
1915 *Notosetia verecunda* (Suter); Iredale, Trans. N.Z. Inst., 47, p. 454.
1933 *Notosetia verecunda* (Suter); Powell, Rec. Auck. Inst. Mus., 1 (4), p. 198, pl. 34, fig. 11 (lectotype).
1955 *Notosetia verecunda* (Suter); Powell, D.S.I.R. Cape Exped. Series, Bull. 15, p. 86.
1955 *Dardanula bollonsi* Powell, D.S.I.R. Bull. 15, Cape Exped. Series, p. 88, pl. 3, fig. 25.
1962 *Notosetia verecunda* (Suter); Smith, (in part) Rec. Dom. Mus. 4 (5), p. 60.

This species has previously been much confused. The lectotype is a dead, rather worn, broadly conical, white shell, of moderate size, with lightly convex whorls. The aperture is large and rounded, the inner lip being considerably thickened, especially posteriorly, and the columella being evenly and strongly convex. The outer lip is thin, except in the posterior corner, and strongly retracted. There is no umbilicus

E. (D.) verecunda resembles *E. (D.) fuscosubucula* n. sp., *E. (D.) latebricola* n. sp. and *E. (D.) dilatata* Powell, but can be separated by its larger size and heavy aperture.

Dardanula bollonsi Powell is a synonym. Not only is the shell identical with types of *E. (D.) verecunda,* but the type material of both was collected in the same dredging off the Snares Islands.

Animal, operculum and radula unknown.

Lectotype: (Fig. 1). 50 fathoms, off Snares Islands, (G.S.).
Height 1.75 mm. Width 1.13 mm.

Material Examined:

Lectotype, paralectotypes (G.S., D.M., A.M.); 50 fathoms, Snares Islands (D.M., A.M.) (and holotype and paratypes of *D. bollonsi*); 95 fathoms, Auckland Islands, Finlay Coll. (A.M.).

Distribution: The Snares and Auckland Islands in deep water.

Subgenus **Pellax** Finlay, 1927.

Type (o.d.): *Phasianella huttoni* Pilsbry, 1888.

Shell: Very large, ovate-conical, rather solid. Peristome thickened, aperture nearly circular.

Animal: Dark red, opercular lobes with a tentacle on each, right with a group of mucous cells at base of tentacle.

Operculum: Muscle insertion area extensive, red, no internal ridge.

Radula: As described for *E. (P.) huttoni.* The broad inner marginal with its 4 blunt cusps is the most unusual feature.

Eatoniella (Pellax) huttoni (Pilsbry). Plate 11, figs. 8-11.

1878 *Rissoa flammulata* Hutton, Journ. de Conch. p. 28.
1880 *Barleeia flammulata* (Hutton); Hutton, Man. N.Z. Moll. p. 81.
1888 *Phasianella huttoni* Pilsbry, Man. Conch. 10, p. 74.
1913 *Phasianella (Tricolia) huttoni* Pilsbry; Suter, Man. N.Z. Moll. p. 169, pl. 34, fig. 12.
1927 *Pellax huttoni* (Pilsbry); Finlay, Trans. N.Z. Inst. p. 368.

This relatively large, handsome species is the largest of the family. It has a distinctive shell, which is pink with white markings giving it a superficial similarity to the phasianellids, with which it was classified. The tall, conical, spire is composed of about six slightly convex whorls, including a smooth, dome-shaped protoconch which is not distinctly terminated. The aperture is moderately large, nearly circular, with a continuous, thickened, white peristome. The inner lip is concave, the outer fairly strongly excavated with a blunt edge. The bright rose-pink shell is sometimes of a uniform colour, but usually there are white zig-zag broad rays and narrow intermediate white or pale pink rays, though the base is always uniform pink and the aperture white. A greenish coloration is often apparent in fresh shells, but this is due to the bright green mantle.

Animal: (Fig. 9). Cephalic tentacles long, tapering, not as active as in other species of *Eatoniella;* eyes on prominent swellings at outer bases of tentacles. Snout short, bilobed. Foot with a very prominent slit in posterior half of sole. Opercular lobes each with a short, colourless

tentacle; a group of large glandular cells near right tentacle. Colour of sides of foot and snout deep red-brown to nearly scarlet, terminal part of snout, tentacles and sole white. Whole exposed animal highly irridescent.

The anatomy of this species is described in a forthcoming publication (Ponder,—a).

Operculum: (Fig. 10). Oval, nearly flat, rather thin, edges yellowish, semi-transparent. Muscle insertion area extensive, opaque, dark reddish on columella side, fading to yellow on outer side. Peg long, slender, curved to right. No internal ridge. Only faint growth lines visible.

Radula: (Fig. 11). Typical of the genus. Central large 3 + 1 + 3, the outermost cusp very small. Lateral rather small, 1 + 1 + 2, with ventral and dorsal thickenings. Inner marginal broad, with 4 weak, blunt cusps. Outer marginal finely serrate, with a broad base.

Holotype: Auckland. (Otago Museum, Dunedin).
Height 6.75 mm. Width 3.75 mm. (from Suter).

Material Examined:

N.Z.O.I. Stat. C. 760 off Three Kings Islands, 34° 10.8' S., 172° 8.4' E., 44 fathoms, 18/2/62 (O.I.); Spirits Bay, shell sand (Hipkins Coll.); 4 fathoms between Cape Maria van Diemen and mainland, -/2/61 (Hipkins Coll.); MacGregor's Bay, shell sand, 9/4/55 (Hipkins Coll.); Bream Tail, *Carpophyllum plumosum* in pools, 21/8/63 (W.F.P.); Goat Island Bay, Leigh, shell sand, 1/1/64 (W.F.P.); Tawharanui Point, North side, *Carpophyllum plumosum* and other browns in pools on papa platform, 31/12/63 (W.F.P.); Jackson's Bay, Coromandel, *Carpophyllum plumosum* in pools on papa platform, 29/3/64 (W.F.P.); Sandy Bay, Coromandel, *Carpophyllum* in pools, sublittoral algae, 30/3/64 (W.F.P.); off Mayor Island, fish stomach contents, G. Williams (Powell Coll.).

Distribution: The North and North East Coast of the North Island living on brown algae. A rather rare species.

Genus **CRASSITONIELLA** n. gen.

Type: *C. carinata* n. sp.

Shell: Solid, ovate-conical, peristome thick and heavy. Sculpture absent or a weak, single, peripheral cord. Colour orange, sometimes with white markings.

Animal: Similar to that of *Eatoniella,* but no opercular tentacles.

Operculum: Broad, with strong internal ridge. Muscle insertion area not differentiated, transparent. Columella margin strongly convex.

Radula: As described for *C. carinata.*

Crassitoniella carinata n. sp. Plate 10, figs. 2-5.

The shell is similar to the Australian *C. flammea* (frauenfeld) (Pl. 10, fig. 1), but differs in the presence of a weak, but distinct, peripheral cord and a uniform colour. Other details as in the Australian species. The species is easily identified by its orange-red colour and solid shell with a wide, blunt protoconch.

Animal: (Coromandel). (Fig. 3). External coloration largely pinkish-white, cephalic tentacles white and snout yellowish. Cephalic tentacles are long, active, slightly tapering; eyes large, on swellings at outer bases

of tentacles. Snout bilobed ventrally, rather short, buccal mass bright yellow. Foot broad, a mucous slit in posterior half of sole, posterior mucous gland large, dense white, bilobed. No opercular tentacles. Eyes normally visible through the transparent, colourless edge of the otherwise opaque shell.

Operculum: (Fig. 4). Pyriform, strongly curved, yellowish, semi-transparent, rather thin. Internal ridge very strong, wide. Peg rather long, straight, slightly oblique, with a thin terminal flange. No clearly marked muscle-insertion area. Area on columella side of internal ridge rather strongly bent inwards, a slightly thickened line runs longitudinally along the middle of this area. A thickened, short ridge on left end edge.

Radula: (Fig. 5). Moderately long, the teeth small. Central very large, lateral cusps small, 1 + 1 + 1, a pair of lateral thickenings, and 3 pairs of basal processes. Lateral small, slightly curved, cusps 1 + 1 + 1. Inner marginal slightly larger than lateral, simple except for blunt process on inner side. Outer marginal small, with 3 denticles, the apex curved.

Holotype: (Fig. 3). Spirits Bay, shell sand, -/4/51 (ex Hipkins Coll.) (A.M.).

Height 1.91 mm. Width 1.3 mm.

Paratypes: Auckland, and Dominion Museums, N.Z. Geological Survey, Lower Hutt, K. Hipkins Collection.

Material Examined:

Holotypes and paratypes; Taupo Bay, Whangaroa, E. R. Richardson, shell sand, 11/4/51 (D.M.); Taupo Bay, 2/1/54 (Hipkins Coll.); Tapeka Point, Russell, shell sand, -/1/52 (Hipkins Coll.); MacGregor's Bay, Whangarei Heads, shell sand, 9/4/55 (Hipkins Coll.); Smuggler's Bay, Whangarei Heads, shell sand, 6/5/62 (W.F.P.); Mokohinau Islands (W.F.P.); East of Jackson's Bay, Coromandel, on *Carpophyllum* in pool, 29/3/64 (W.F.P.).

Distribution: North East of the North Island, living on algae, but rare.

Genus **LIRATONIELLA** n. gen.

Type: *L. bicarinata* n. sp.

Shell: Solid, with a few, strong, spiral keels. Aperture nearly circular, peristome not much thickened.

Animal: Details not known.

Operculum: Broad, muscle insertion area opaque, extensive, columella margin rather convex.

Radula: As described for *L. bicarinata*.

Liratoniella bicarinata n. sp. Plate 11, figs. 1-3.

Shell of moderate size for the family, white, with a dark red inner chitinous layer showing through, solid yet semi-transparent, with two heavy spiral keels on each whorl. Protoconch sharply angled, a weak cord on edge of angle, rather flat on top, not distinctly marked off. Whorls 4, two strong spiral cords on each whorl, one cord just below suture, other just above, with suture in a narrow groove between them. A flat space between cords, raised higher than sutural groove, and

smooth except for slightly oblique, fine growth lines. A strong spiral cord on base emerging at junction of outer lip with inner lip. Just behind outer lip there are only weak spirals. Aperture nearly circular, columella strongly excavated, thin; peristome continuous, sharp. Outer lip bent downwards in posterior corner and reflected slightly. Last half of body whorl with no chitinous layer and therefore pure white.

Animal: Unpigmented, cephalic tentacles in preserved animal appear to be dorso-ventrally flattened and rather short. Eyes large and on outer bases of tentacles. Snout short, distinctly bilobed. A long slit in posterior half of sole. Male aphallic (preserved material).

Operculum: (Fig. 2). Broadly oval, curved, the columella edge expanded so that the peg hardly projects over it. Left end transparent, yellow-brown in colour. The muscle insertion area dense, extensive. Marginal area rather narrow. Peg curved, grooved. No sculpture apart from weak growth lines. Colour light brown.

In shape this operculum closely resembles that of the superficially similar *"Estea" crassicordata* Powell (see Ponder,—c) but their radulae are totally different.

Radula: (Fig. 3). Typical of family. Central rather large, the cusps small 2 + 1 + 2. Lateral small, 1 + 2 + 1, with a dorsal ridge and a weak ventral thickening. Inner marginal narrow, curved, with 3 cusps of similar size. Outer marginal finely serrate, with a broad basal area.

Holotype: (Fig. 1). N.Z.O.I. Stat. C. 760, 34° 10.8' S., 172° 8.4' E., off Three Kings Islands, 44 fathoms, bryozoan substratum, 18/2/62 (O.I.).

Height: 1.975 mm. Width 1.26 mm.

Paratypes: New Zealand Oceanographic Institute, Auckland and Dominion Museums.

Material Examined: Holotype and paratypes.

Distribution: Off the Three Kings Islands.

Liratoniella crassicarinata (Powell). Plate 11, fig. 4.

1936 *Estea crassicarinata* Powell, Discov.Rep.,15,p.196,pl.53,fig.4.

This species is tentatively placed in *Lirotoniella* as it resembles *bicarinata* in most features. It differs from the type species in smaller size and uniform yellowish-brown colour, with the tip of the spire tinged with reddish-brown. There are four spiral keels on the penultimate whorl and above the periphery of the body whorl, and three on the base.

Animal, operculum and radula unknown.

Holotype: Discovery II Stat. 933, off the Three Kings Islands, 260 metres (Brit. Mus.).

Height 1.5 mm. Width 0.8 mm. (from Powell)

Material Examined:

Paratypes (Powell Coll.); Discovery II Stat. 932, off the Three Kings Islands, 185 metres (Powell Coll.); 100 fathoms off Big King Island, Three Kings Islands, Finlay Coll. (A.M.); Spirits Bay, shell sand, (Hipkins Coll.).

Distribution: The far North of the North Island in moderately deep water.

Genus **PUPATONIA** n. gen.

Type: *Estea minutula* Powell, 1933

Shell pupate, minute, white, solid; aperture ovate, peristome thickened, outer lip bent downwards at suture. Sculpture of fine, close, spiral lines. Imperforate.

Though superficially similar to *Microdryas* Laseron, *Pupatonia* differs in having a thicker shell, a different aperture, and less definite sculpture. Whereas *Microdryas* is related to the *Estea-Scrobs* group, *Pupatonia* is probably an eatoniellid.

Animal, radula and operculum unknown.

Pupatonia minutula (Powell). Plate 10, fig. 12.

1933 *Estea minutula* Powell, Rec. Cant. Mus. 4, p. 37, pl. 6, fig. 6.

This species can be recognised by its minute size, solid build and fine microscopic spiral striae. The aperture is solid and D-shaped. The inner lip being thick and broad, and the outer lip thickened within, but with a sharp edge, nearly straight except bent down a little above and produced forwards.

Holotype: (Fig. 12). 170 fathoms, Bounty Islands, Coll. Capt. Fairchild (Cant. Mus.).

Height 1.23 mm. Width 0.61 mm.

Material Examined:

Holotype and paratypes; Foveaux Strait, oyster dredgings (W.F.P.); Butterfield's Beach, Stewart Island, shell sand, O. Allan (D.M.); 50 fathoms, Snares Islands, Finlay Coll. (A.M.); 40-50 fathoms, Bounty Islands (D.M.); N.Z.O.I. Stat. A. 739, Bounty Islands, 49° 40.2' S., 178° 44.3' E., 60 fathoms (O.I.).

Distribution: Foveaux Strait, Stewart Island and the Snares and Bounty Islands.

Pupatonia atoma n. sp. Plate 10, fig. 15.

Shell very minute, solid, pupoid, white, imperforate. Whorls 4, protoconch dome-shaped, not marked off, smooth; whorls weakly convex, false margined, with distinct growth lines and very fine, irregular, spiral scratches. Body whorl not swollen, periphery and base rounded. Aperture oval, peristome thickened, especially in anterior and posterior corners. Columella thick, vertical, inner lip a little oblique above. Posterior corner of aperture thick and weakly angled. Outer lip bent down and produced forward slightly near suture, nearly straight below, edge sharp, thickened internally. Differs from other species of the genus in its smaller size. Animal, operculum and radula unknown.

Holotype: (Fig. 15). N.Z.O.I. Stat. A. 739, Bounty Islands, 49° 40.2' 178° 44.3' E., 60 fathoms (O.I.).

Height 0.8 mm. Width 0.4 mm.

Paratypes: N.Z. Oceanographic Institute, Auckland and Dominion Museums.

Material Examined:

Holotype and paratypes; 50 fathoms, Snares Islands, Finlay Coll. (A.M.); 170 fathoms off Puysegur Point, South West Otago (Powell Coll.).

Distribution: Off the South of the South Island, the Snares and Bounty Islands.

Pupatonia gracilispira (Powell). Plate 10, fig. 14.

1933 *Estea gracilispira* Powell, Rec. Auck. Mus. 1, p. 201, pl. 34, fig. 4.

This species differs from *P. minutula* in having a slightly narrower spire and in being smooth and polished. Animal, operculum and radula unknown.

Holotype: (Fig. 14). 10 fathoms off Owenga Beach, Chatham Islands.
Height 1.1 mm. Width 0.525 mm.

Material Examined: Holotype and paratypes.

Distribution: Chatham Islands.

Pupatonia pupinella (Finlay). Plate 10, fig. 13.

1905 *Rissoa leptalea* Murdoch; Trans. N.Z. Inst., 37; p. 228, figs. 23, 24.
1913 *Rissoa leptalea,* Murdoch, Suter, Man. N.Z. Moll. p. 213, pl. 12, fig. 22.
1927 *Notosetia pupinella* Finlay, (nom. nov. for *R. leptalea* Murdoch, 1905 non Verrill, 1885); Trans. N.Z. Inst. 57, p. 494.
1962 *Epigrus pupinella* (Finlay) Smith Rec. Dom. Mus. 4 (5), p. 61-62, fig. 3.

Smith (1962) has established Murdoch's type was collected in the Foveaux Strait area. The original type is missing and Smith has selected a neotype from Stewart Island which she figures.

The shell is distinctive with its tall cylindrical spire, dilated outer lip, and microscopic, dense spiral striae. The outer lip is bent slightly downwards posteriorly. Animal, radula and operculum unknown.

Neotype: Off Poutama Island, South Cape of Stewart Island, 30 fathoms, in bryozoan shell-sand (D.M.).
Height 1.85 mm. Width 0.59 mm. (from Smith)

Material Examined:
Topotypes; Bathing Beach, Stewart Island, shell sand, O. Allan, 1950 (D.M.).

Genus **SKENELLA** Martens and Pfeffer, 1886.

Type (monotypy): *S. georgiana* M. and P., 1886.

The single New Zealand species, *S. pfefferi Suter* 1909, agrees well with the type in shell characters. A short description of a shell of *S. pfefferi* from Kapiti Island, Cook Strait, is given below for comparison with related genera:—

Shell thin, yellowish brown, semi-transparent. Whorls $2\frac{1}{2}$, convex, rapidly increasing; spire a depressed dome; protoconch smooth, not marked off; body whorl large, convex. Aperture large; peristome continuous, thin, inner lip a thin glaze across parietal wall; columella thin, near vertical; outer lip thin, strongly retracted below, produced forward posteriorly, with two prominent indentations in the middle region. Umbilicus broad, with strong growth lines, bordered by a sharp ridge. Sculpture of fine growth lines only.
Height 0.425 mm. Width 1.71 mm.

Animal: Typical of the family. Cephalic tentacles long and active, emerging from indentations in outer lip; eyes visible beneath the shell. Foot active, extensile, with a mucous slit in posterior half of sole. No pigmentation of exposed parts.

The eggs are very large and yolky, and the male has no penis.

Operculum: Oval, thin, slightly curved, nucleus very small, sunken; peg not heavy, grooved, connected to rest of operculum over nearly all

of its length. Columella marginal area moderately wide. Muscle insertion area not visible. Growth lines rather prominent.

Radula: Central very large, with two basal processes, 2 + 1 + 2, lateral small, long, 4 + 1 + 1, the outer two cusps large, the fifth largest. Inner marginal 3 + 1 + 1, the outer two cusps large, the fourth largest; outer marginal finely serrate, basal area wide.

S. pfefferi is distributed throughout New Zealand from the Three King Islands to Stewart Island and the Chatham Islands. It appears to be restricted to exposed coasts in the North, though it has not been found on the Auckland West Coast, but is generally more common in the South. It prefers large brown algae, on which it may be very abundant, but is also found on short algae, such as *Corallina*, in small numbers.

THE NEW ZEALAND SPECIES OF THE EATONIELLIDAE

The generic name last used follows in brackets.

Eatoniella Dall, 1876 (*Rissoa kerguelenensis* Smith, 1875)

(*Eatoniella*)

kerguelenensis chiltoni (Suter, 1909) (*Dardanula*)

stewartiana n. sp.

(*Abscindostoma*) n. subgen. (*Rissoina olivacea* var *lutea* Suter, 1908)

lutea (Suter, 1908) (*Dardanula*)

albocolumella n. sp.

(*Albitoniella*) n. subgen. (*Dardanula pallida* Powell, 1937)

pallida (Powell, 1937) (*Dardanula*)

thola n. sp.

(*Albosabula*) n. subgen. (*Rissoa lampra* Suter, 1908)

lampra (Suter, 1908) (*Notosetia*)

poutama (Smith, 1962) (*Zeradina*)

rakiura n. sp.

(*Caveatoniella*) n. subgen. (*E.* (*C.*) *puniceomacer* n. sp.)

puniceomacer n. sp.

perforata n. sp.

(*Cerostraca*) Oliver, 1915 (*C. iredalei* Oliver, 1915)

bathami n. sp.

delli n. sp.

maculosa n. sp.

tenella (Powell, 1937) (*Dardanula*)

(*Dardaniopsis*) n. subgen. (*E.* (*D.*) *notalabia* n. sp.)

notalabia n. sp.

globosa n. sp.

pullmitra n. sp.

varicolor n. sp.

? atervisceralis n. sp.

(*Dardanula*) Iredale, 1915 (*Dardania olivacea* Hutton, 1882).

olivacea (Hutton, 1882) (*Dardanula*) (= *Dardanula olivacea annulata* (Hutton)

dilatata (Powell, 1955) (*Notosetia*)

fossa n. sp.

fuscosubucula n. sp.

latebricola n. sp.

limbata (Hutton, 1883) (*Dardanula*)
minutocrassa n. sp.
mortoni n. sp.
obtusispira (Powell, 1955) (*Dardanula*)
roseocincta (Suter, 1908) (*Dardanula*)
roscola (Iredale, 1915) (*Dardanula*) (= *Dardanula roscola lacteola* Powell)
roseospira (Powell, 1937) (*Dardanula*)
smithi n. sp.
verecunda (Suter, 1908) (*Notosetia*) (= *Dardanula bollonsi* Powell, 1955)
(*Pellax*) Finlay, 1927 (*Phasianella huttoni* Pilsbry, 1888)
huttoni (Pilsbry, 1888) (*Pellax*)
Crassitoniella n. gen. (*C. carinata* n. sp.)
carinata n. sp.
Liratoniella n. gen. (*L. bicarinata* n. sp.)
bicarinata n. sp.
crassicarinata (Powell, 1937) (*Estea*)
Pupatonia n. gen. (*Estea minutula* Powell, 1933)
minutula (Powell, 1933) (*Estea*)
atoma n. sp.
gracilispira (Powell, 1933) (*Estea*)
pupinella (*Epigrus*)
Skenella Martens and Pfeffer, 1886 (*S. georgiana* M. and P., 1886)
pfefferi Suter, 1909 (*Skenella*)

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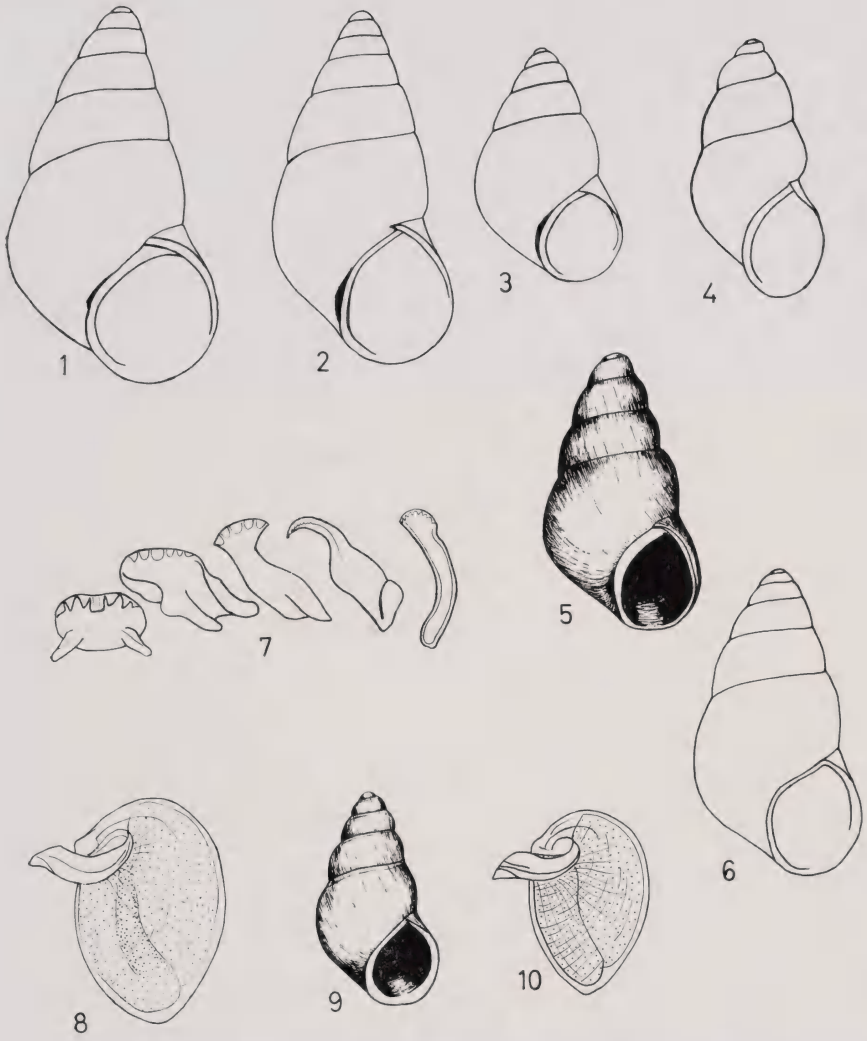


Eatoniella (*Eatoniella*) *kerguelenensis kerguelenensis* (Smith, 1875) ..

Fig. 1. Kerguelen Island, 3.5 x 1.95 mm.

Eatoniella (*Eatoniella*) *kerguelenensis chiltoni* Suter (1909)

Fig. 2. Chatham Islands, 3.26 x 1.67 mm.

3. Chatham Islands, 2.17 x 1.35.

4. Snares Islands, 2.41 x 1.8.

5. Holotype, 2.53 x 1.5 mm.

6. Dunedin Harbour, 2.83 x 1.55.

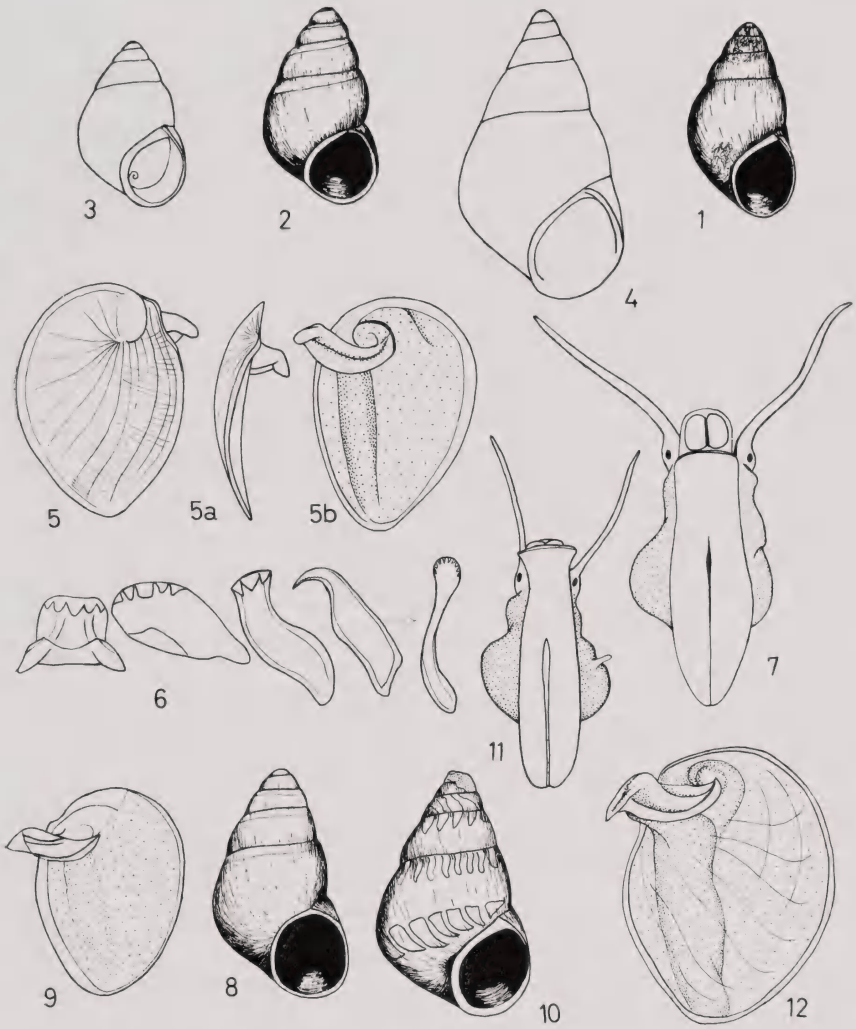
7. Radula.

8. Operculum (inner side).

Eatoniella (*Eatoniella*) *stewartiana* n. sp.

Fig. 9. Holotype, 2.0 x 1.15 mm.

10. Operculum (inner side).



Eatoniella (*Dardanula*) *olivacea* (Hutton, 1882)

Fig. 1. Lectotype, 1.88 x 1.01.

2. Lectotype of *olivacea* var. *annulata* Hutton 1.9 x 1.125 mm.

3. A specimen from the 'cotype' material in the Canterbury Museum, 1.6 x 1.0 mm.

4. Waiwera (large form), 2.8 x 1.575 mm.

5 a, b. Operculum (outer, lateral and inner sides).

6. Radula.

7. Animal (ventral view)

Eatoniella (*Dardanula*) *smithi* n. sp.

Fig. 8. Holotype 2.2 x 1.3 mm.

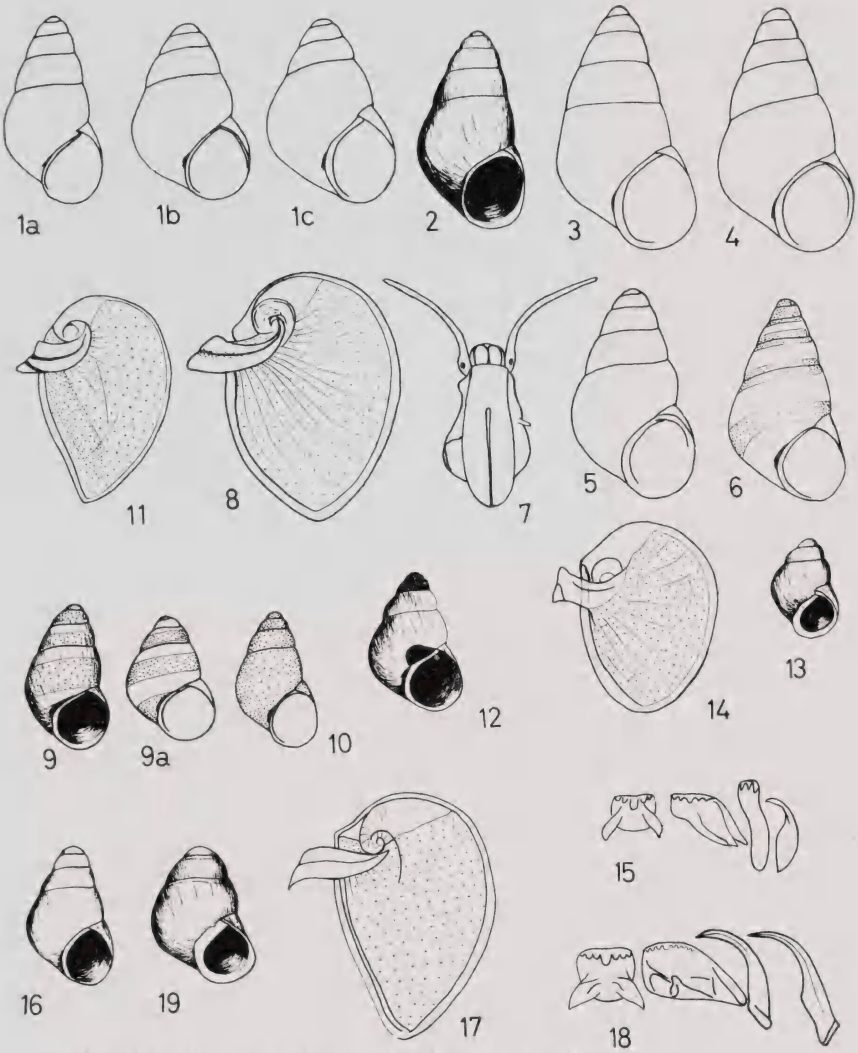
9. Operculum (inner side).

Eatoniella (*Dardanula*) *limbata* (Hutton, 1883)

10. Lectotype, 2.4 (estim.) x 1.5 mm.

11. Animal (ventral view).

12. Operculum (inner side).



Eatoniella (*Dardanula*) *roseola* (Iredale, 1915)
Fig. 1, a, b. Doubtful Sound, 50 fathoms, 1.73 x 0.9 mm. (a) 1.65 x 1.1 mm. (b) 1.72 x 1.2 mm.
2. Auckland Islands, 1.85 x 1.00 mm.
3. Bluff (pale pink form) 1.85 x 1.275 mm.
4. Holotype of *Dardanula roseola lacteola* Powell 2.265 x 1.275 mm.
5. Stewart Island, 1.93 x 1.14 mm.
6. Tryphena Bay, Great Barrier Island 1.85 x 1.05 mm.
7. Animal (ventral view).
8. Operculum (inner side).

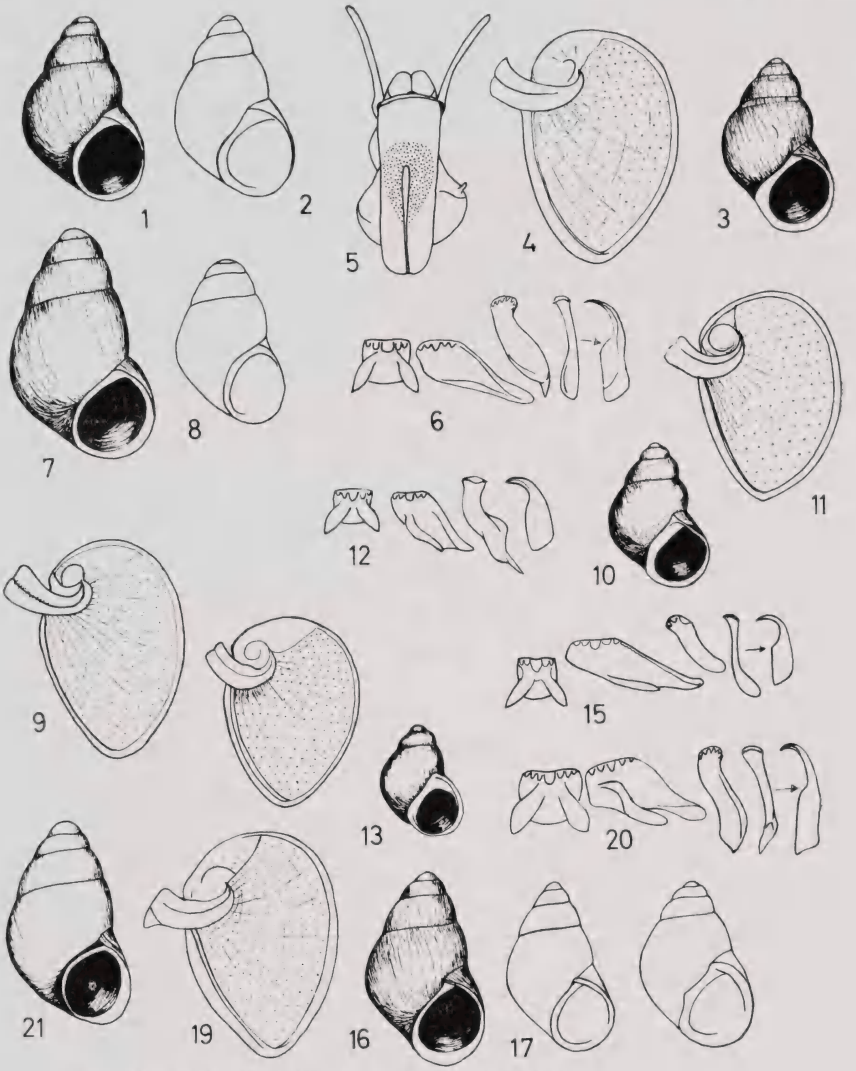
Eatoniella (*Dardanula*) *roseocincta* (Suter, 1908)
Fig. 9. a. Paratypes (9) 1.35 x 0.775 mm. (a) 1.15 x 0.8 mm.
10. Awanui Bay, 1.25 x 0.725 mm.
11. Operculum (inner side).

Eatoniella (*Dardanula*) *roseospira* (Powell, 1937)
Fig. 12. Paratype, 1.3 x 0.875 mm.

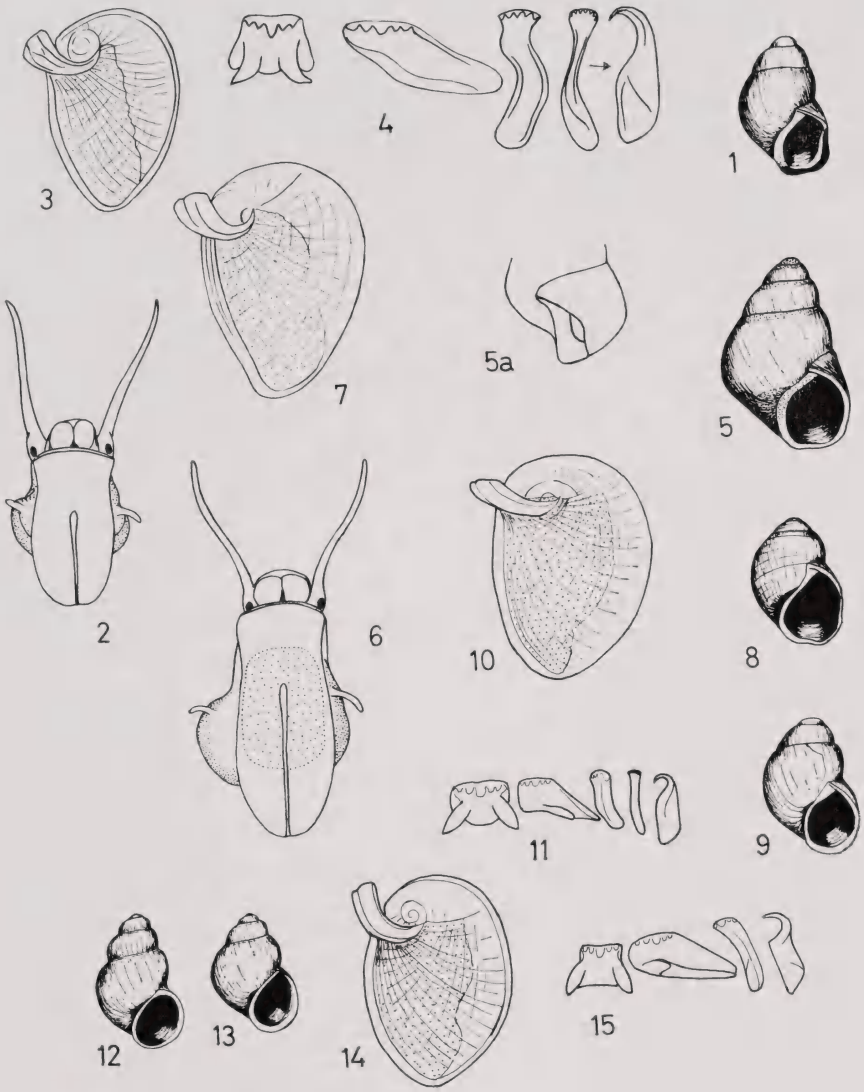
Eatoniella (*Dardanula*) *minutocrassa*, n. sp.
Fig. 13. Holotype, 0.925 x 0.6 mm.
14. Operculum (inner side).
15. Radula.

Eatoniella (*Albitoniella*) *pallida* (Powell, 1937)
Fig. 16. Paratype, 1.3 x 0.8 mm.
17. Operculum (inner side).
18. Radula.

Eatoniella (*Albitoniella*) *thola* n. sp.
Fig. 19. Holotype, 0.95 x 1.25 mm.



Eatoniella (*Dardanula*) *verecunda* (Suter, 1908)
Fig. 1. Lectotype 1.75 x 1.13 mm.
2. Holotype of *Dardanula bollonsi* Powell 2.71 x 1.125 mm.
Eatoniella (*Dardanula*) *latebricola* n. sp.
Fig. 3. Holotype, 1.65 x 1.05 mm. 4 Operculum (inner side).
5. Animal (ventral side). 6. Radula.
Eatoniella (*Dardanula*) *obtusispira* (Powell, 1955)
Fig. 7. Holotype, 2.2 x 1.4 mm.
8. Off Poutama Island, Stewart Island, 30 fathoms, 1.6 x 1.25 mm. 9. Operculum (inner side).
Eatoniella (*Dardanula*) *fuscosubucula* n. sp.
Fig. 10. Holotype, 1.4 x 0.95 mm. 11. Operculum (inner side).
12. Radula.
Eatoniella (*Dardanula*) *dilatata* (Powell, 1955)
Fig. 13. Holotype, 1.05 x 0.78 mm. 14. Operculum (inner side).
15. Radula.
Eatoniella (*Dardanula*) *mortoni* n. sp.
Fig. 16. Holotype, 1.85 x 1.13 mm.
17. MacGregor's Bay, Whangarei Heads, 1.625 x 1.025 mm.
18. Red Rocks, Wellington, under *Durvillea* holdfasts 1.6 x 1.1 mm.
19. Operculum (inner side). 20. Radula.
Eatoniella (*Dardanula*) *fossa* n. sp.
Fig. 21. Holotype, 1.9 x 1.2 mm.



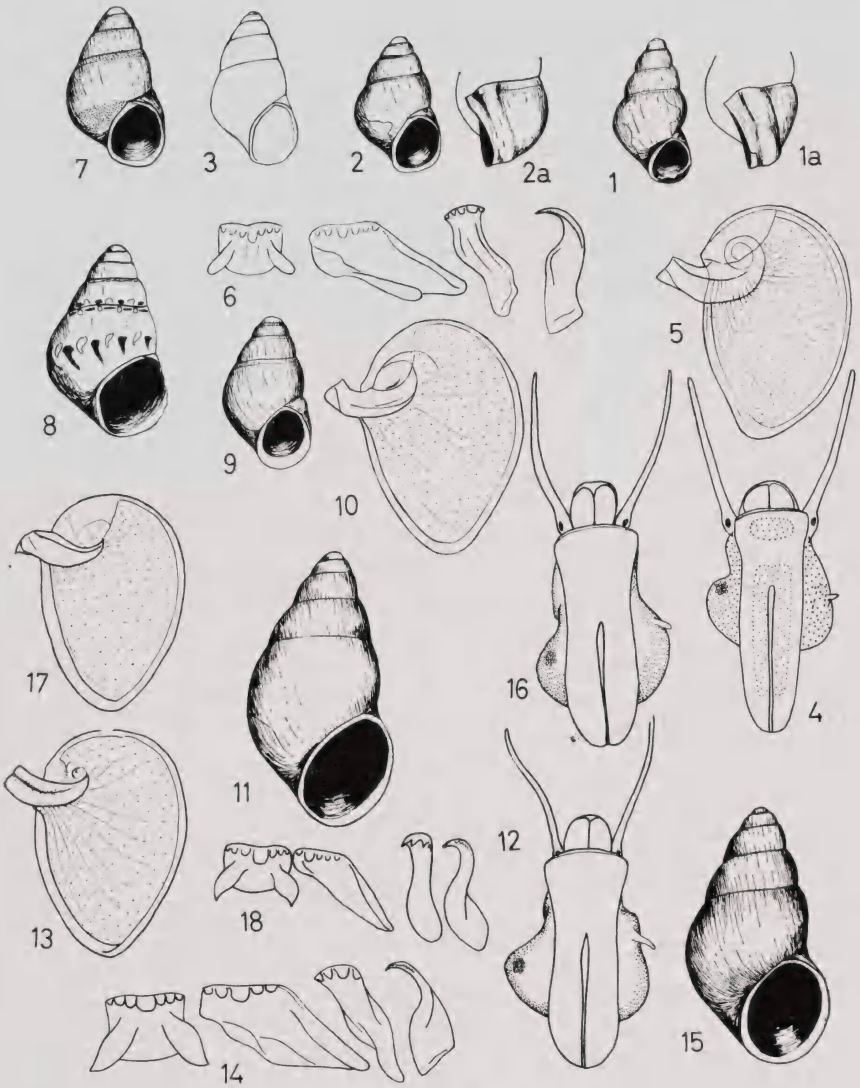
Eatoniella (Dardaniopsis) notalabia n. sp.
Fig. 1. Holotype, 1.26 x 0.8 mm.
2. Animal (ventral view).
3. Operculum (inner side).
4. Radula.

Eatoniella (Dardaniopsis) varicolor n. sp.
Fig. 5, a. Holotype, 1.73 x 1.13 mm.
6. Animal (ventral view).
7. Operculum (inner side).

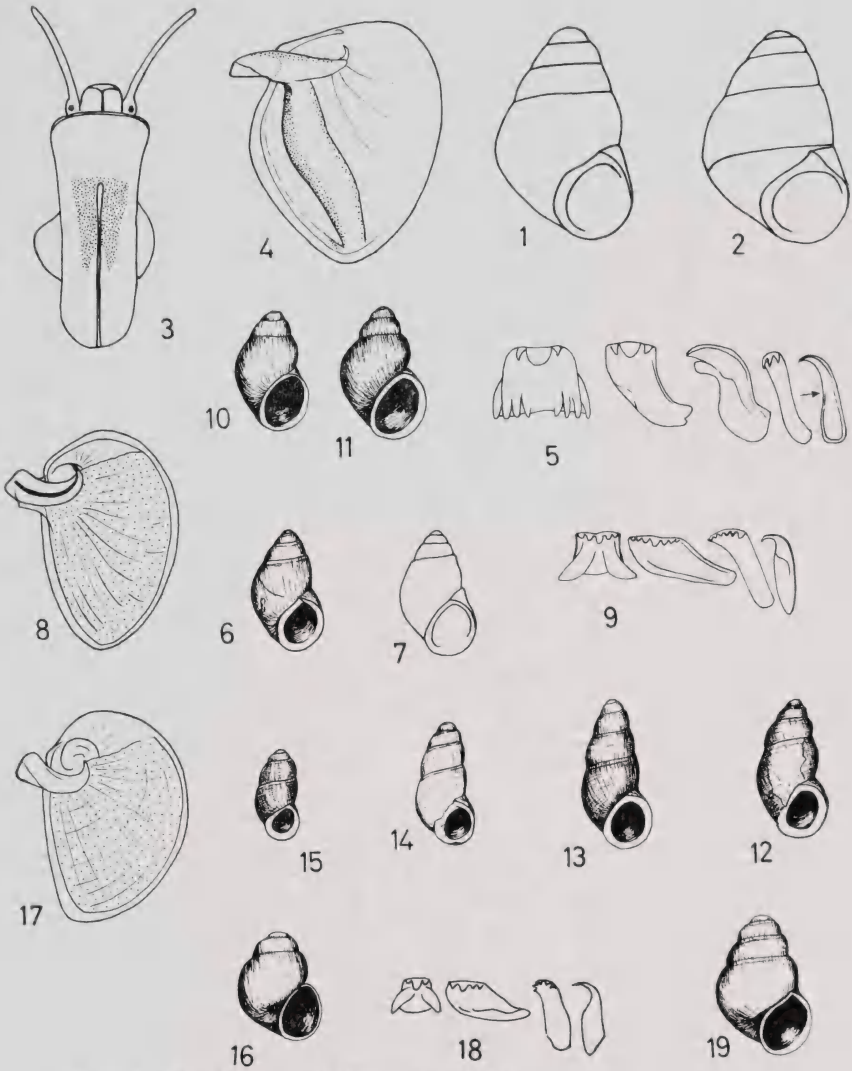
Eatoniella (Dardaniopsis) globosa n. sp.
Fig. 8. Holotype, 1.15 x 0.8 mm.

Eatoniella (Dardaniopsis) pullmitra n. sp.
Fig. 9. Holotype, 1.23 x 0.85 mm.
10. Operculum (inner side).
11. Radula.

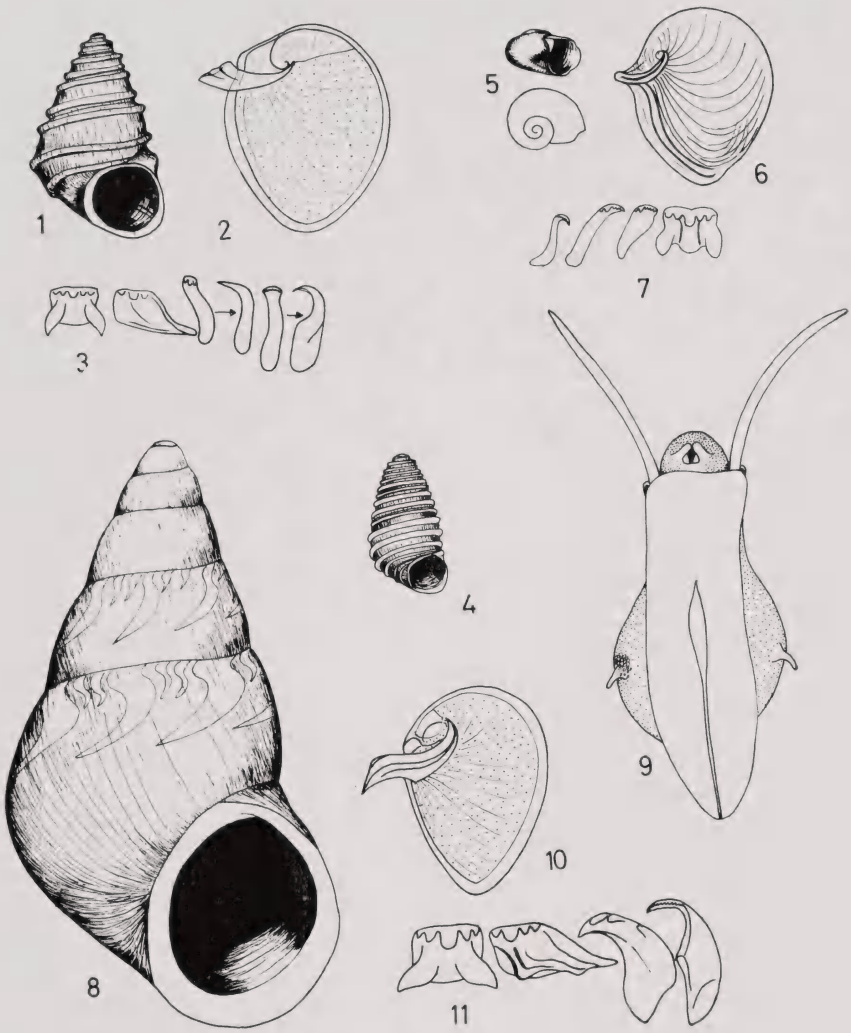
Eatoniella (Dardaniopsis?) atervisceralis n. sp.
Fig. 12. Holotype, 1.23 x 0.75 mm.
13. Paratype (globose form) 1.07 x 0.75 mm.
14. Operculum (inner side).
15. Radula.



Eatoniella (*Cerostraca*) *iredalei* (Oliver, 1915)
Fig. 1, a. Holotype, 1.35 x 0.7 mm.
Eatoniella (*Cerostraca*) *delli* n. sp.
Fig. 2, a. Holotype 1.24 x 0.73 mm.
3. East of Purau, Lyttelton Harbour, 1.4 x 0.77 mm.
4. Animal (ventral view). 5. Operculum (inner side).
6. Radula.
Eatoniella (*Cerostraca*) *maculosa* n. sp.
Fig. 7. Holotype, 1.48 x 0.875 mm.
Eatoniella (*Cerostraca*) *tenella* (Powell, 1937)
Fig. 8. Paratype, 1.76 x 1.1 mm.
Eatoniella (*Cerostraca*) *bathami* n. sp.
Fig. 9. Holotype, 1.42 x 0.8 mm. 10. Operculum (inner side).
Eatoniella (*Abscindostoma*) *lutea* (Suter, 1908)
Fig. 11. Paralectotype, 2.53 x 1.36 mm.
12. Animal (ventral view). 13. Operculum (inner side).
14. Radula.
Eatoniella (*Abscindostoma*) *albocolumella* n. sp.
Fig. 15. Holotype, 2.37 x 1.35 mm.
16. Animal (ventral view).
17. Operculum (inner side). 18. Radula.



Crassitoniella flammea (Frauenfeld, 1867)
Fig. 1. Sydney, New South Wales, Australia, 1.91 x 1.25 mm.
Crassitoniella carinata n. sp.
Fig. 2. Holotype, 1.91 x 1.3 mm. 3. Animal (ventral view).
4. Operculum (inner side). 5. Radula.
Eatoniella (*Albosabula*) *lampra* (Suter, 1908)
Fig. 6. Paralectotype, 1.1 x 0.625 mm.
7. Groper Island, Paterson Inlet, Stewart Island. 1.125 x 0.66 mm.
8. Operculum (inner side). 9. Radula.
Eatoniella (*Albosabula*) *rakuria* n. sp.
Fig. 10. Holotype, 1.1 x 0.65 mm.
Eatoniella (*Albosabula*) *poutama* (Smith, 1962)
Fig. 11. Doubtful Sound, 50 fathoms, 1.2 x 0.78 mm.
Pupatonia minutula (Powell, 1933)
Fig. 12. Holotype, 1.23 x 0.61 mm.
Pupatonia pupinella (Finlay, 1927)
Fig. 13. Topotype, 1.35 x 0.625 mm.
Pupatonia gracilispira (Powell, 1933)
Fig. 14. Holotype, 1.1 x 0.525 mm.
Pupatonia atoma n. sp.
Fig. 15. Holotype, 0.8 x 0.4 mm.
Eatoniella (*Caveatoniella*) *puniccomacer* n. sp.
Fig. 16. Holotype, 0.95 x 0.73.
17. Operculum (innner side). 18. Radula.
Eatoniella (*Caveatoniella*) *perforata* n. sp.
Fig. 19. Holotype, 1.25 x 0.85 mm.



Liratoniella bicarinata n. sp.

Fig. 1. Holotype, 1.975 x 1.26 mm.
2. Operculum (inner side).
3. Radula.

Liratoniella crassicarinata (Powell, 1937)

Fig. 4. Paratype, 1.35 x 0.71 mm.

Skenella pfefferi (Suter, 1909)

Fig. 5. Kapiti Island, 0.425 x 1.71 mm.
6. Operculum (inner side).
7. Radula.

Eatoniella (Pellax) huttoni (Pilsbry, 1888)

Fig. 8. Goat Island Bay, 6.0 x 3.15 mm.
9. Animal (ventral view).
10. Operculum inner side).
11. Radula.